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A QUARTERLY REVIEW

OF THE MOST IMPORTANT ARTICLES APPEARING IN THE MEDICAL PRESS AT LARGE.

EDITED BY

CHARLES E. SAJOUS, M. D.

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VOL. I. PHILADELPHIA, MAY, 1888. No. 4.

DERMATOLOGY.

UNDER THE CHARGE OF

ARTHUR VAN HARLINGEN, M.D.,
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SYMMETRICAL GANGRENE AND SCLERODERMA.

Goldschmidt gives the case of a woman, 47 years of age, who, in September, 1881, began to experience intermittent attacks of itching, followed by swelling of the right hand. The following autumn the left hand began to be affected also. About the same time the plantar surfaces of the feet became affected, showing small depressions with raised borders and occasional peeling of the epidermis.

During this autumn the condition of the hands went on until Raynaud's disease showed itself ("*mains mortes*"), pallor of the fingers, followed by redness and burning, etc. The face also began to show changes of sensation, swelling, etc., until at length it became swollen, bronzed, hard, and with tense skin, showing a mask-like appearance, with the eyelids and nose alone supple and mobile. The mucous membrane of the fauces became somewhat infiltrated, the voice coarse and raucous. Subsequently (in 1884) small gangrenous patches developed on the hands.

In the spring of 1885 the patient suffered with erysipelas of the face, from which she recovered. After this, a growth of arborescent blood-vessels—a sort of rosacea—showed itself like a collar around the neck before and behind. About the same time a gangrenous patch occurred on the front of the right leg, which gave great pain, and was followed by an ulcer which healed with much difficulty at the end of a year. The following year new gangrenous points occurred about the old cicatrix, and, involving it in a large ulceration, healed with difficulty. During this time, with the exception of slight anæmia, the patient's health was good.

During the winter of 1885–86 the patient began to feel a certain difficulty in moving the neck and the limbs. This was not due to

induration of the integuments, but to lesions of the muscles and tendons. The muscles about the neck could be felt hard under the skin, and in the forearm and lower part of the thighs a feeling and sound like the cracking of new leather could be perceived on movement.

The hands could not be completely closed, but remained in a state of partial flexion, in this case due to thickening and hardening of the skin. The skin of the hands and fingers became clay-colored, the latter at times turning almost black under the influence of attacks of local asphyxia. Small ulcers showed themselves repeatedly upon the fingers. The forearms showed thickening of the integument and wasting, this condition gradually fading into the healthy skin above. The patient could no longer pick up small objects and could scarcely hold a pen. The feet and hands were constantly bathed in a cold sweat. The lower part of the limbs were œdematous.

Toward the end of the year 1886 the patient's general condition became deteriorated. The heart especially became disordered (dilatation with hypertrophy of the right side), and finally the patient was obliged to take to her bed permanently. Even here she became almost suffocated on moving, and on December 11th she rose suddenly from her bed and fell dead.

The results of the autopsy showed chronic endarteritis and endophlebitis of the terminal vessels of the skin. No alteration in the nerves was observed. The author concludes that the case was one of Raynaud's disease and scleroderma combined.—*Gaz. Méd. de Strasbourg*, February 1, 1888.

ALOPECIA AREATA.

Max Joseph adds another to the numerous lengthy papers published in Germany recently upon this subject, considering the affection as a tropho-neurosis. He alludes to the experiments which have been made, and the clinical observations which have been recorded with reference to the influence of general disturbances of nutrition, and also of psychoses, upon the condition of the hair, but properly remarks upon the very insufficient data as yet obtained. Although in the highest degree probable that alterations, and particularly shedding, of the hair may at times be dependent upon nervous influence, yet exact proof is still wanting.

Joseph himself has made some experimental researches in animals which enable him to assert that (1) there is such a thing as a distinct bundle of trophic nerves; (2) that in cats we can produce a circumscribed alopecia by extirpation of the spinal ganglia of the second pair of nerves of the neck, together with portions of the neighboring posterior and anterior roots.

Although the clinical observations thus far made are, taken singly, not convincing, yet, when viewed collectively and in connection with

the results of physiological experiment, we seem to have strong evidence in favor of the tropho-neurotic nature of alopecia areata.

Headache is among the commonest premonitions of alopecia areata. Though vague and uncertain as to its locality and severity, this symptom is almost always noticed. Another point observed is that the headache and the fall of the hair cease simultaneously. Schultze observed in his own case that the headache passed gradually into a peculiar paræsthesia, consisting of brief attacks of increased heat of the scalp, with sometimes annoying pricking. Kaeseler, describing also his own case, says that in a relapse which he suffered in his sixteenth year, he experienced congestive symptoms about the head, and every two or three weeks profuse epistaxis. At the same time sudden spontaneous pains occurred in the scalp at irregular intervals and at various points. These were of a peculiar pricking quality, lasting only a few minutes. Pulling the hair did not increase the pain, while pressure on the affected points stopped it. In other cases, as that of Kopp, general hyperæsthesia of the scalp and other parts of the body was observed.

Michelson gives the case of a watchmaker, 40 years of age, who had bilateral symmetrical bald patches corresponding to points of the head which he habitually leaned upon the side of a sofa during seven months previous to the shedding of the hair. Numbness was observed in the bald patches, which disappeared upon friction.

A number of observers, notably Hutchinson, have asserted the very frequent concurrence of general weakness, or ailment of some sort, with alopecia areata. It is possible, also, says Joseph, that constitutional dyscrasiæ, as syphilis, may influence the occurrence of alopecia areata. Michelson, Bärensprug, and Boeck have published cases which point this way. Heredity may also prove an etiological factor. Ziemssen cites the case of four sisters who suffered from alopecia areata, Gamberg the case of three members of the same family who showed the disease. Wilson cites a family in which two sisters, an uncle, and the latter's father had the disease. Veiel gives several cases where heredity could be proved. In a number of instances of hereditary neurotic families the nerve-weakness seems at times to give place to an alopecia.

But the most interesting cases are those in which the alopecia is clearly observed to be dependent upon some nervous disturbance. Neurasthenia, Basedow's disease, and Addison's disease have repeatedly been observed in connection with alopecia areata. Ollivier, in thirty cases out of a hundred, found decided and evident nervous influences, dependent upon psychical disturbances,—as fright, care, anxiety, mental over-exertion, nervous deafness, general paralysis, chorea, etc.,—among the causes.

When the neuropathic predisposition is present, very slight influences are enough to cause the appearance of some nervous disease. Two causes, however, are prominent,—traumatic and psychical affections. Cases in which circumscribed alopecia has followed strong emotion are not so astonishing when it is considered that only a temporary cause was sufficient to energize a hereditary proclivity.

As regards traumatic causes, Kopp gives a case of local baldness following the bite of a horse upon the back of the neck in a neurotic individual; and Schwimmer one where a wound ("trauma") of the left temple was followed by coin- to bean-sized bald patches on the left side of the head, the upper lip, and the neighborhood of the chin. Joseph cites a number of similar cases. He regards the cases of "alopecia neurotica" reported in literature, and most of which were the result of traumata, as belonging to a different category from that form of alopecia under consideration.

Joseph considers the question whether age has not some connection with the etiology of alopecia areata. Observers differ somewhat in the results obtained by their statistics. Pye-Smith, in a series of 33 cases found the average age 15 years, with a variation from 4 to 25 years, and a single case 40 years of age. Of Hutchinson's 42 patients, the average was 14 years. In comparing all the cases which he could obtain from the literature of the subject with those occurring under his own observation, Joseph concludes that, the youngest patient being 4 years of age, while the oldest was 27, the average being $12\frac{1}{2}$ years, the affection is in some way connected with the second dentition and puberty; but this he does not make clear.

We know at present only one condition, for certain, which is dependent upon "trophic nerves;" that is, the suspension of their activity giving rise to subsequent atrophy. We can not say whether certain dystrophiæ and paratrophiæ, as well as certain inflammations, are or are not referable to similar causes. That certain forms of atrophia areata occur about the time of puberty seems, however, to indicate some similar influence at work in alopecia areata. This seems to indicate that while the trophic nerves under ordinary circumstances exercise no influence, or but little, yet in certain stages of development they may excite the metamorphosis of matter in the organism to a greater degree.

As regards the more immediate cause of alopecia, we must seek for it in some factor which influences the alteration of the hair-matrix. Putting aside micro-organisms as not proved to be the cause, we may have either direct nerve influences or changes in the vessels. The latter seems to have no facts to support the probability of its existence. Joseph considers Behrend's views on this subject (see ANNUAL for current year) as devoid of foundation, and handles him without

gloves, even doubting whether his cases were those of true alopecia, which, in view of Behrend's reputation, seems impertinent.

Joseph then goes on to speak of the scanty anatomical records of alopecia areata, calls attention to the fact that the sensory nerves do not seem to run in the same lines and in connection with the trophic nerves, and winds up his very diffuse article without drawing any more important conclusion than that we must report cases more accurately and fully before we can expect to draw conclusions. To which may be added a prayer to our German colleagues to talk less and say more. The literature of alopecia areata which has appeared in Germany in the last year or so would fill a volume, while the new facts could easily be condensed in a few pages. Reference may be made to Joseph's article, for the recent bibliography of the subject, in *Berlin. Klin. Wochens.*, Jan. 30 and Feb. 6, 1888.

DEVELOPMENT OF EPITHELIOMA IN LUPUS.

Finger says that the number of cases where epithelioma has developed in lupus are few, but new ones are being reported. He thinks that some old cases of *L. vorax* were of this sort. The face is usually attacked, in persons from 40 to 50 years, and usually in men. The epithelioma occurs more frequently in old than recent lupus, and in non-ulcerated than in ulcerated localities. The form is usually vegetative and ulcerative; the prognosis unfavorable. Heredity seems to have some influence.—*Fortschr. d. Med.*, from *Annales de Derm. et de Syph.*, 1888.

THE PRINCIPLES OF THE TREATMENT OF CHRONIC ECZEMA.

Jarisch gives us an attractive title, for who would not rather have some principles on which to act in the management of this common and troublesome affection rather than the simple addition of new formulæ to old?

He truly says that there is no such thing as a specific local treatment of eczema. The treatment is and must be entirely symptomatic.

It must be remembered that the irritability of the skin is not only different in different cases, but also varies in the same case at one time or another. This gives us our principle in treatment, namely, the greater the irritability the more perfectly "indifferent" the local application. In addition, cases should be under frequent observation.

The means ordinarily employed in the local treatment of eczema are divided by Lassar into three different classes: (1) Drying and protective, "indifferent" applications. (2) Softening and macerating applications. (3) Applications having the effect of diminishing hyperæmia and aiding cornification.

In the first category we include dusting powders, and particularly Lassar's paste, which is composed as follows: R. Pulv. acidi salicylici,

gr. x–xx; pulv. amyli, pulv. zinci oxidi, āā gr. c; vaselini, gr. cc.—M. This paste may be spread with the hand over the affected part, which is then to be powdered. This paste is peculiarly useful in acute eczema, but may also be employed in the chronic stages of the disease. In cases of papular eczema, where macerating remedies produce an increase in severity and also a spread of the eruption, this application is of use. The simple dry powders of starch, oxide of zinc, etc., also claim a place here.

To come to the second category, that of softening and macerating materials, we have water, most ointments, salve-soaps, soaps, plasters, and plaster mulls. The indication for the employment of these remedies is found in the accumulation of the products of disease on the skin and in its excessive dryness.

Among the members of this class which may cause irritation we must include soaps and impermeable dressings, which therefore can only be used in cases where there need be no fear lest we should arouse fresh eruption. Among the milder remedies of this class are the ointments, which rarely excite irritation. Why one of these should be used rather than another; why in one case we use diachylon, in another borax, zinc, salicylated ointments, etc., we can not say. Jarisch thinks the main point in every instance is the same, namely, the maceration of the skin. He thinks that ointments with a high melting-point like diachylon macerate better than those of low melting-point like vaseline, and are therefore preferable.

When ointments do not seem to agree, Jarisch recommends having recourse to Unna's plaster mulls (easier to talk about than to get in this country), or Pick's salicylic soap-plaster, of which Jarisch does not give us the formula.

To the third class of applications belongs tar,—a valuable remedy, but one not to be used for the first time without precaution. Its chief use is found in squamous conditions.

A fourth category may be added to the first three,—that of antipruritics. Jarisch has not much to say about these, but recommends alcohol and carbolic acid solutions.—*Cbl. f. Gesammt. Therap.*, Jan., 1888.

TREATMENT OF ULCERS BY PHOSPHORIC ACID.

Grossich uses a 10 per cent. solution of pure phosphoric acid in distilled water. The ulcer is covered with lint dipped into this solution, and the dressing renewed three or four times a day. The treatment is very successful in scrofulous ulcers. In tubercular glands of the neck, if there is no fluctuation, he injects a hypodermic syringeful of the solution into the gland, which becomes reduced in size in twenty-four hours (so Grossich says, but let not the experimenter hope for like results).—*Lond. Med. Rev.*, 1888, from *Gaz. Med. Ital., Lomb.*

OPHTHALMOLOGY.

THE PROGRESS OF OPHTHALMOLOGY IN RUSSIA IN 1887.*

UNDER THE CHARGE OF

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TRACHOMA.

Schmidt has made 58 experiments in the culture of the microbe of trachoma. In 47 cases he obtained a pure culture; in 6 there was no result; in 3, a mixed culture; and in 2 instances the microbes had no connection with the disease. Macroscopically the form of the culture was very characteristic, but microscopically it differed but little from the staphylococcus pyogenes. The inoculations of rabbits, rats, and dogs, gave only a slight ordinary catarrhal conjunctivitis, but with cats and pigeons the characteristic forms were produced. It is to be remembered that the pigeons had all the symptoms of trachoma prior to the experiment.

Korvetzky advises crushing and expression of the trachoma-follicles, when these are isolated. He avoids injury of the surrounding conjunctiva.—*Médecine Russe*, *St. Petersburg*, January, No. 4.

Reich, while assenting to the plan of crushing the trachomatous follicles, at the same time insists upon a hygienic régime with the soldiers among whom trachoma is an ever-present disease. [Mr. Reich does not, as he should, make the proper distinction between trachoma and follicular conjunctivitis.] The galvano-cautery is the therapeutic agent chiefly recommended.—*Médecine Russe*, June.

Wadsinsky advises sub-conjunctival injections of antiseptic substances in trachoma: among others carbolic acid 2 to 7 per cent., and the bichloride of mercury 2 per cent.!—*Médecine Russe*, October.

Reich, in view of the rapid propagation and frequency of follicular conjunctivitis among the Russian troops, recommends isolation of those afflicted and their removal from the common barracks. According to him, the treatment should consist in both prophylactic and therapeutic measures, the first being much more important. It is held that suitable places should be chosen, dry, elevated, etc., where light

* Professor Maklakoff's report having reached the editorial department too late for publication in the ANNUAL, the editor thought that it might be of interest published as received.

houses might be constructed or tents pitched. Strict isolation should be insisted upon.—*Jour. de Méd. Militaire, St. Petersburg*, February.

Zwiaguinutzeff notices that often only a single eye becomes trachomatous, or that the inflammation is of unequal severity in the two eyes, and concludes that the contagious matter is not so penetrating as commonly supposed. He thinks that predisposing causes are of primal importance in the etiology of the affection. He is of the same opinion as Reich as to the necessity of the isolation of those attacked, though not emphasizing it so strongly.—*Jour. de Méd. Militaire*, September.

Reich recommends galvano-puncture of the trachomatous follicles not only of the palpebral portion of the conjunctiva, but also of the bulbar part. He finds this method of treatment much more efficacious than crushing the follicles.—*Rev. Méd., Moscow*, No. 9.

Fialkowsky inquires what is to be done with the trachoma of the army, and replies by proposing the isolation of the patients, and the establishment of special hospitals in the most healthy localities. He insists especially upon the necessity of a study of the disease, and upon the formation of a committee to fix upon an accurate nomenclature.—*Moniteur d'oph. Kiew, I.*

Reich gives the description of the forms of conjunctivitis that he has observed in some parts of the Caucasus. The inhabitants of this region have been frequently credited with being the starting-point for the extensive propagation of trachoma among the Russian soldiers. The author, however, finds that the varieties of conjunctivitis indiginous to the country are entirely innocuous, and cannot consequently be the cause of trachoma. The probability is that the frequency of trachoma in the army is due to the antihygienic conditions of the soldiers.—*Moniteur d'oph. Kiew, I.*

Troïtzky asserts that trachomatous affections may break out in the eyes of any person if they are exposed to irritating agencies, such as dust, wind, reading, physical labor, etc., and if at the same time the daily life is surrounded by unhygienic circumstances of the most elementary kind. Under such conditions every simple catarrhal conjunctivitis may be speedily transformed into pronounced trachoma. The author would replace the treatment of this latter type by prophylactic measures for those with beginning irritation of the eyes.—*Moniteur d'oph. Kiew, I.*

Troïtzky, treating of trachoma in the army, says that the number of patients actually attacked with the clearly pronounced type of the disease does not exceed 4 per cent., whilst the rest are always disposed to the disease on account of the non-hygienic conditions of military

life. It were wiser, according to the author, to diminish the predisposing conditions among the healthy, who are the majority, than to make useless efforts to combat the pronounced forms of the affection. —*Moniteur d'oph. Kiew, I.*

Reich, in his discussion with Professor Adamück concerning follicular and trachomatous conjunctivitis, promises to give the description of the favorable results he has obtained in treating patients in the hygienic institutions lately established in the Caucasus for the treatment of trachomatous soldiers.—*Wratch*, February.

Adamück thinks trachoma a purely contagious malady, and for this reason recommends isolation of those affected, and every precaution against the transmission of the virus. This is especially necessary on the part of the physician who commonly uses the same crystal of cupric sulphate upon many patients.—*Wratch*, June.

CAUSES OF BLINDNESS.

Sergnieff gives the results of his inquiry into the causes of blindness among the agricultural portion of the district of Nolinsk. It concerns as well the blindness of a single eye and of both eyes. Of the 829 cases, 328 were males and 501 females. Trachoma was the most frequent cause, and next to this small-pox. (In 112 cases only 4 had been vaccinated.) The percentage of cases of congenital blindness was 1.9, whilst that due to traumatism was 4.7.—*La Cécité et ses Causes, etc, etc., Thèse inaugurale, St. Petersburg*, 1887.

PECULIAR METHOD OF THE TRANSMISSION OF SYPHILIS.

Tepliachine writes of a peculiar Russian custom. Among the peasantry, many explain almost every affection of the eyes as due to the presence of foreign bodies between the lids where such bodies may be retained. In order to extract them the tongue of some person is introduced between the lids, and into the conjunctival sacs where the supposed foreign body is lodged. This procedure is very widespread, and, as may be readily understood, syphilis may in this way very easily be transmitted. The author describes a veritable epidemic of syphilis in the government of Wiatka. Within two months he had in his hospital eight cases of syphilis of the lids (with mucous patches also of the anus and genitalia). The relatives of the patients themselves stated that the syphilitic virus had been thus inoculated by a woman of the village that everybody thought a female physician. The author examined this woman and found upon her all the symptoms of syphilis. He also discovered in the neighboring hamlets 68 syphilitic cases, amounting to 13 per cent. of all the population, one-half of whom, or 34, were inoculated by the same woman.—*Wratch*, April.

REFRACTIVE CONDITION OF STUDENTS

Sussman has examined 273 pupils of a college in Siberia in order to determine the refraction, the visual acuity, the ophthalmoscopic conditions, and the circumstances of the illumination of the buildings in which the schools are held. The results are highly interesting. The author determined the static refraction by the ophthalmoscope, and the functional refraction by test lenses. He found that 89 per cent. had functional myopia, whilst the static refraction showed hypermetropia or emmetropia. Thus, in a total of 273, the true refractive condition was shown in 146 hyperopes, 8 emmetropes and 20 myopes, whilst the functional refraction was illustrated in 15 hyperopes, 47 emmetropes, and 211 myopes. It is therefore seen that hyperopia simulated emmetropia by the intervention of the accommodation, or became transformed into myopia by the same means.—*Moniteur d'oph. Kiew, I.*

CAUSES OF BLINDNESS IN THE ARMY.

Lawzentieff gives instructive particulars concerning the frequency of blindness in the army. Among the newly enlisted (conscripted) there is a high percentage of the anomalies of refraction, whilst among old soldiers there is a great deal of inflammatory ocular affections. The author concludes that this is due to barrack-life.—*Jour. de Méd. Milit.*

THE ORIGIN OF STRABISMUS.

Beloff, having studied the theory of Stilling concerning the origin of strabismus, gives the results of his personal observations and experiments upon himself. He finds that the condition of rest of the eyes corresponds not only to the position of parallelism of the visual axes, but also to the position of divergence, or of convergence. The position of rest may be seen in sleep, or during the disassociation of the eyes in the act of binocular vision,—(when one eye is covered in order to fix with the other, no reason exists for binocular fixation, nor for convergence of the visual axes). The first condition corresponds to the static equilibrium and the second to the dynamic equilibrium. In the first, the eyes always occupy a divergent position, according to our author; and in the second, or that of disassociation, they occupy either of the three positions. Adduction of the eyes is brought about by the action of the internal recti muscles, but abduction is affected only by relaxation of the interni, and not by the active contraction of the abductor muscles. Consequently, if one wishes to overcome the force of a prism, apex outward, he has only to relax the adductors in order to unite the double (or crossed) images and thus return to the position of static equilibrium. The experiments and conclusions are worthy of attention.—*Moniteur d'oph. Kiew. I.*

CATARACT-EXTRACTION.

Katzaouroff gives the description of a new, "simplified," method of cataract extraction. The method is neither new nor original. It consists in combining the corneal incision with the iridectomy and rupture of the capsule, completed with the same (v. Graefe) knife. The author is especially pleased in having dispensed with an instrument.—*Moniteur d'oph. Kiew, I.*

IRRIGATION OF ANTERIOR CHAMBER.

Khodine recommends a very simple apparatus for the purpose of irrigating the anterior chamber after the operation of cataract. It consists of a small funnel and a glass pipe united by a rubber tube. The liquid used is a 4 per cent. solution of boric acid. The author has not found a case of suppuration of the corneal flap or of the chamber since adopting its use.—*Moniteur d'oph. Kiew, I.*

OPERATION UPON THE LID.

Denotkine explains an operative procedure for delivering the cornea from the exaggerated pressure which the superior lid, with the deformed tarsus, may exercise upon the globe of the eye. The process consists only in an insignificant modification of that of De Wecker. The single difference consists in the application of the thermo-cautery to the part denuded of cartilage.—*Moniteur d'oph. Kiew, I.*

TUMORS OF THE ORBIT.

Ewetzky, in his onkological studies, gives the description of two cases he has examined in the clinic of Moscow. The types considered are a cylindroma of the orbit and an alveolar sarcoma of the orbit.—*Moniteur d'oph. Kiew, I.*

INEQUALITY OF THE PUPILS.

Iwanoff thinks he has found pupillary inequality among 134 conscripts, the left pupil being larger than the right twice as often as the reverse. At the same time he pretends to have found a greater development, etc., of the left side of the head. The observations and the conclusions drawn from them do not appear to your correspondent to be well founded.—*Wratch*, February.

Zwiaguinutzeff reports his observations concerning the inequality of the two pupils in healthy persons. He has found it present in 10 per cent. of his cases.—*Med. Russe*, October.

DEVELOPMENT OF THE NASO-LACHRYMAL CANAL.

Ewetzky, in studying the embryological development of the naso-lachrymal canal, finds that this organ begins to develop at the end of the fifth or beginning of the sixth week of fœtal life, and that

it proceeds upon the same type as with other mammals.—*Moniteur d'oph. Kiew. I.*

CHANGES IN THE EYE FROM LIGHT.

Denissenko writes of the changes in the eye taking place under the influence of light. The greater part of the matter is a compilation of well-known facts. Among the investigations mentioned are the works of Boll, Kühne, Engelmann, Genderen, Van Stort, Denissenko, Gradenigo, etc.—*Moniteur d'oph. Kiew, I.*

SYMBLEPHARON, ETC.

Likharewsky describes a case of symblepharon caused by the application of some irritating substance. He also gives the description of a case of dermoid cyst successfully operated upon.—*Moniteur d'oph. Kiew, I.*

HYSTERICAL AMAUROSIS AND METALLO-THERAPY.

Jelnikhine reports a case of hysterical amaurosis cured by metallotherapy in a few minutes. A piece of gold caused such a pricking sensation as to become insupportable.—*Moniteur d'oph. Kiew, I.*

OCULAR DISEASE FROM RECURRENT FEVER.

Lubinsky describes the cases of iritis and choroiditis observed in the hospitals of Kronstadt. All were the result of recurrent fever. The author finds that opacities of the vitreous are always more pronounced wherever the iritis or choroiditis is more intense.—*Moniteur d'oph. Kiew, I.*

ALBUMINURIA AND CATARACT.

Ewetzky discusses the relations of albuminuria and cataract. In order to verify the opinion of Deutschmann concerning the coincidence of cataract and nephritis, he has made many observations in the hospitals and asylums for the aged of Moscow. Deutschmann's conclusions are not confirmed.—*Moniteur d'oph. Kiew, I.*

ERYTHROPSIA.

Koubli reports five cases of erythropsia,—the first in an aphakic eye, the second and third during pregnancy, the fourth and fifth in consequence of want of proper nutrition (vegetable diet during the Easter church fasts). There was no other change in the eyes except the diminution of luminous sensibility, particularly at the periphery of the retina, shown in the last two cases by the existing hemeralopia. —*Moniteur d'oph. Kiew, I.*

COLOBOMA OF THE GLOBE.

Lebedeff describes a case of cystoid coloboma of the globe of the eye. The vice of conformation was bilateral.—*Moniteur d'oph. Kiew, I.*

CATARACT PRODUCED BY VIBRATIONS.

Von Stein reports the results of his experiments with young guinea-pigs, from two days to five weeks old. The animals were placed in a box and subjected to the influence of the continual vibrations of a diapason from 100 to 250 beats per second. So early as the end of the first day there were manifest the signs of posterior polar cataract, sometimes of the anterior variety. The cataract disappeared within three or four days, leaving only traces of obscurity in the cortical portions.—*Rev. Méd., Moscow*, January.

DIPHTHERITIC OPHTHALMOPLEGIA.

Ewetzky describes a case of ophthalmoplegia externa, the result of an unperceived diphtheritic sore-throat.—*Rev. Méd., Moscow*, January.

CEREBRAL CENTRES FOR LIGHT REACTIONS.

Darkchevitch asserts that (1) an isolated lesion of the tubercular quadrigemina, even without disturbance of the centres of the third pair, is capable of abolishing the pupillary reaction to light, (2) the abolition of the light reaction does not, however, take place until there is some injury to the posterior commissure of the brain; (3) the removal of the superior part of the tubercular protuberances produces disorder in the reflex movements of the pupils whenever the posterior commissure is effected. Therefore, the superior part of the quadrigeminal eminences—*i. e.*, the part surrounding the aqueduct of Sylvius—is the path of the conductors of luminous irritation of the retina, above the centres of the common motor nerve.—*Rev. Méd., Moscow*, January.

THE AMBLYOPIA OF SYPHILIS.

Tomachewsky calls attention to the amblyopia that develops during the condylomatous period of syphilis, and that disappears quickly upon the cure of the general malady. The author believes that this amblyopia is a variety of that painful and tactile sensibility of the skin observed in the condylomatous period of syphilis.—*Wratch*, February.

TRAUMATIC LESIONS.

Katzaoüroff reports three cases of traumatic lesions of the eye, —one from a fragment of the cap of a gun, another from grains of powder, and the last from a piece of glass.—*Wratch*, March.

PEROXIDE OF HYDROGEN.

Maklakoff recommends peroxide of hydrogen not only as a therapeutic agent, but also for diagnostic purposes. This is because of its peculiarity of penetrating the interstices of tissues during the period of its decomposition. It thus becomes a powerful antiseptic remedy,

and in setting free large quantities of gas it renders visible the spaces, furrows, etc., that one would not see, and whose existence would otherwise be unsuspected.—*Méd. Russe*, January, 1887.

HEMERALOPIA.

Krawkoff notes the existence of endemic hemeralopia in the army. The affection was found to appear in 38 cases immediately upon a diminution of the fatty constituents of the rations ordered by the military authorities for reasons of economy. [During the Russian church fasts, when no meat is eaten, large numbers of the communicants are attacked with hemeralopia. There were 320 such cases in one hospital in St. Petersburg in the years 1882–1887.—*Note by the translator.*]—*Méd. Russe*, August.

OTOLOGY.

UNDER THE CHARGE OF

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ALLOCHIRIA AUDITIVA.

Allochiria, or the reference of a sensation to the opposite side of the body from that where is located the actual stimulus, a phenomenon first noted and described by H. Obermeister (*On Allochiria—A Peculiar Sensory Disorder.* Brain, 1882), has been hitherto clinically associated with tabes and other spinal diseases, and has been observed only as a mode of cutaneous sensation. Gellé (*Société de Biologie; séance du 14 Janvier, 1888*) reports a case in which the same crossing took place in audition, and which presented no symptoms of tabes or other spinal disease.

Hammond has suggested the following as the possible mechanism of the phenomenon: In the case of unilateral spinal disease, on the right side for example, an impression from the left periphery would encounter obstruction in the right posterior columns, but through the gray commissure might excite the left sensory tracts and eventually appear in consciousness as if from the right periphery. Bilateral lesions are not generally symmetrical, and if they occur on different planes an indefinite number of such reflexions may take place. If such are of odd number, allochiria would result; if even, it would not. This mechanism explains how a complete hemianæsthesia can be associated with a subjective hyperæsthesia of both sides, and throws light upon Brown-Séquard's

observation, that lateral hemisection of the cord is followed by anæsthesia of the opposite and hyperæsthesia of the same side. Like Hammond, Gellé insists upon the existence of this medullary hyperæsthesia in allochiria, while Longuet objects that it is not a correlative of the phenomenon. Gellé's case is that of a young woman presenting no sign of central nervous lesion or of any general neurosis, but who suffered from auditory hyperæsthesia upon the left side in consequence of a chronic hyperplastic otitis media so that, although the acuity of hearing was diminished, the sounds heard were painful. Auscultation of the right carotid revealed a loud, musical murmur. This sound the patient herself perceived, but as if from the *left* side. All sources of error in the observation were eliminated. The question of spinal lesions being set aside, Gellé seeks an explanation of the phenomenon in bone-conduction and the left-sided hyperæsthesia, to which latter is due an actually greater performance of the auditory nerve than takes place upon the right. The resulting error in consciousness is therefore material rather than formal. Gellé suggests, as bearing upon the case, an explanation of the mechanism whereby we are led to infer the location of a sound in space. If the apparatus of auditory accommodation be put into play binauricularly, as is done by unconscious reflex, and if the acuity of hearing be equal on both sides, the side of apparently greater loudness will be inferred to be nearer the source of sound. If now, from error in the accommodative apparatus, or from hyperæsthesia on the one side, or from both, the data are modified, the inference will be invalid until a new empiricism is acquired suited to the new conditions.

Féré reports an analogue to Gellé's observation in a case of hysteria, in which faradization of an anæsthetic muscle produced contraction, not of the muscle itself, but of the corresponding muscle upon the opposite side.

Brown-Séquard sees in Gellé's case new evidence in support of his doctrine, that there are not independent sensory centres for the two halves of the body, but that corresponding centres are in most intimate connection.—*La Semaine Méd.*, January 18, 1888.

[Gellé's case seems to be one of ordinary contra-audition, and to call it allochiria seems an unnecessary confusion of terms. The crossing is of physical vibration, and takes place before the auditory nerve begins its work. If a crossing should take place afterward in the transference of auditory impression from the periphery to the conscious centre of sound, such would be an allochiria auditiva. Bartholow's experiment, in which a powerful irritation—as, for example, puncture with a pin—is normally felt at the corresponding point upon the other side, throws some light upon the mechanism of allochiria, and is plausibly explained by commissural function.—C. L. W.]

MEASLES AND LABYRINTHINE DISEASE.

Professor Moos has made a critical examination of the temporal bones of a child of three years who had died of catarrhal pneumonia seven days after the eruption had appeared.

He divides the labyrinthine lesions into two groups. The first comprises changes in the lymph-spaces analogous to those which he had already described in diphtheria (*Arch. of Otol.*, xvii, No. 1; Ann. of the Univ. Med. Sci., 1888). There is an accumulation of leucocytes which completely fills the spaces. The second group comprises changes in the vascular walls and consequent thrombosis. This thrombosis, produced by fatty degeneration of the endothelium, can go on to complete obliteration of the vessel; and to the same the author would attribute the various atrophies and changes in the form of the membranous parts, and the necrosis and colloid metamorphosis of the osseous tissue. It is this thrombosis which produces an amyloid degeneration in the stapedius, such as has also been observed by Zencker in typhoid fever. The author describes also an atrophy of the terminal nerve-filaments in the crests of the ampullæ and in the cochlea. The analogy of these lesions to those in diphtheria led the author to look for a micro-organism.

The micro-organism found belongs to the order of coccacæ, and is distinguishable by its round form from the oblong coccus with rounded end which Manfredi found constant in company with the Friedlander coccus in the pneumonia of measles. This spherical form is preserved whether the organisms appear as mono-, diplo-, or tetracocci—the latter occurring rarely. They are grouped irregularly, or in chains or loops. The predominance of chain-formation would, however, warrant the designation of streptococcus. Whether such are to be considered the specific germs of measles is very questionable. The analogy of diphtheria where a streptococcus of an accidental and not of a specific nature invades the labyrinth would lead us, however, to believe that they are not. On the other hand, the loss of tissue and the opening of lymph-channels in diphtheria suggests a ready mechanism of the migration, while in the case of measles with the mucosum intact, no such way is open to the labyrinth, and invasion is more likely to be systemic,—a supposition more in harmony with the assumption of a pathogenic quality of the micro-organism. As it is, none of the microbes observed in measles by Cornil, Babes, Manfredi, and others, as yet fulfill all of the canons of bacteriological induction, and pending further research the mode and nature of the labyrinthine involvement must remain relegated to the investiganda.

A search for the micro-organism described was in one of the bones (the right) unsatisfactory, possibly owing to some error in technic. It

was found only in the medullary spaces and in the products of nerve-disorganization in the lamina spiralis ossea.

On the left side, however, it was found not only here, but in the Haversian canal, in the endo- and perilymphatic spaces of the semicircular canals, to a marked extent in the periosteum, which had undergone hyaline degeneration, and in the corresponding necrotic bone. An intracellular occurrence was observed only in the medullary cells, where, to the number of six, in chain form, the microbes were arranged near to the cell-wall. A similar appearance was noted in the colloid bodies of the medullary spaces. The search in the cochlea was altogether fruitless.

In the labyrinthine involvement of diphtheria we find a process of new-formation (viz., small-cell infiltration in the Haversian canals and medullary spaces, as well as hyperplasia of the periosteum in various regions,—for example, in the semicircular canals and in the periosteum of the petrous pyramid) proceeding side by side with that of necrosis,—for example, of the bone and medullary substance. In the case of measles, however, there is necrosis only, and no process of new-formation. In this respect Moos' coccus is similar in action to Manfredi's coccus. The latter, however, provokes a cellular necrosis by working within the cell itself, destroying nucleus and the whole structure, while the action of the former is more likely indirect, and brought about by thrombosis in consequence of a mycotic fatty degeneration of the endothelium. As to the mechanism of migration into the labyrinth, Moos can suggest only the same working hypothesis which he offered in the case of diphtheria, and which is based upon the anatomical relations of the labyrinth, in particular upon the connection between the endo- and perilymphatic spaces and the cranial cavity.

By whatever mode the invasion takes place, the hypothetical mechanism of the tissue change is as follows: The lymph coagulation may be considered in the case of measles, as well as of diphtheria, a purely mechanical event, conditioned by the presence of the micro-organism. Disorganization of the lymph element in the endolymphatic spaces which possess no blood-vessels can be brought about by an intracellular action of the microbe, and can be looked upon as a mycotic necrosis. The same can be brought about in all vascularized territories in the same manner, or may be from the vascular thrombosis, or both causes may work. This thrombosis is in consequence of a mycotic fatty degeneration of the endothelium. The action of the microbe can, furthermore, play an important part in the production of the hyaline degeneration and nerve-disorganization in the lamina spiralis ossea.

The necrotic changes in the bone, or its total disappearance, is

probably due to obliteration of the Haversian canal and a direct action of the microörganism upon the tissue. Both factors may be sufficient to the same result. The vascular necrosis also may have a double cause. Such could take place from a long standing of the thrombus, whereby the nutrition of the vessel suffers, or there may be a direct mycotic action.

What is characteristic in the clinical picture of this disorder is a permanent total deafness and a disturbance of equilibrium arising in the course of an attack of measles.—*Tageblatt der 60ten Versammlung Deutscher Naturforscher und Aerzte in Wiesbaden*, September, 1887; *Zeitschrift f. Ohrenh.*, xviii, No. 1, 1888; *Untersuchungen über Pilz-Invasion des Labyrinthes im Gefolge von Masern* von Prof. Dr. S. Moos, Wiesbaden, 1888; Bergmann.

AURAL AND GENERAL DISEASES.

Wolff seeks to establish a relationship not hitherto noted between certain affections. In addition to meningitis, cerebro-spinal fever, typhus, leucæmia, syphilis, chlorosis and anæmia, saturnine, mercurial, and nicotine intoxications, and parturitions too many and frequent, he speaks particularly of those maladies in which the sound-conducting apparatus is subjected to a pathogenic influence. Of these, influenza occasions the most frequent aural complication by extension of the catarrhal process to the middle ear. The resulting otitis is generally of a mild form, and yields readily to appropriate treatment, it rarely becoming purulent. The catarrhal pneumonia of children often determines most grave tissue changes, and, not infrequently, labyrinthine exudation with pronounced and persistent deafness, and more or less long-continued error in equilibration.

The croupous pneumonia of adults is rarely complicated with aural disease, but certain acute affections of the ear and the pneumonia are often at the same time epidemic, as if each were due to the same or allied micro-organisms.

Scrofula and tuberculosis have an influence of which the manifestations are almost as frequent as those of influenza, and it should be noted also that children of these diatheses are subject much more than others to the auricular complications of the exanthemata. The author looks upon the great number of mastoid affections with caseous deposits as osseous tuberculosis.

Acute miliary tuberculosis may produce a rapid necrosis of the ossicles.

The ear affections of measles, like those of influenza, rarely have an untoward result except in the case of cachectic children.

Apropos to scarlatinal otitis, the author relates two cases in which the exanthem declared itself during the course of an acute otitis

media. The symptoms were aggravated, and in one case a trephining of the mastoid was necessary, but both cases recovered,—the one on the sixteenth, the other on the thirteenth day after the inflammation had set in.

As regards diphtheria of the middle ear, medical literature has been lately enriched by numerous works. But the recent discoveries of Moos have demonstrated that the labyrinth can become involved and its functions totally destroyed without lesion of the tympanum. On the other hand, Moos observed a number of cases in which there was exudation into the drum.

The tympanum is frequently involved in acute rheumatism, and the inquiry arises whether the articulations of the ossicles do not suffer with the other joints of the body. Trautmann and others have observed hemorrhagic extravasation into the lining membrane of the middle ear in consequence of embolism.

Diabetes mellitus is responsible for many of the aural affections coming on at or after middle age.—*Tageblatt der 60ten Vers. Deutscher Naturf. und Aerzte in Wiesbaden*, September, 1887; *Rev. Mens*, etc., Feb. 1, 1888.

CONTRIBUTION TO THE ETIOLOGY OF AFFECTIONS OF THE MIDDLE EAR IN CHILDHOOD.

Dr. E. Pins says, in the *Jahrbuch für Kinderheilkunde*, that diseases of the middle ear are exceedingly common in childhood, and especially in the first few months of life. The exciting causes of these diseases are numerous, and most of them are well known; but, in addition to those which are described in the treatises on ear diseases, the author lays stress on the following: (1) The entrance of water into the external ear during the daily bath. (2) The difficulty of keeping the nose clean in children; the secretions are apt to remain in the nose to decompose, and to set up catarrhal and putrid inflammatory conditions of the nasal mucous membrane, which spread to the middle ear. (3) Catarrhal pneumonia is very frequently attended by middle-ear disease, as is well known to be the case with croupous pneumonia. As regards symptoms, the boring of the head on the pillow is dwelt on as one of special importance under the first heading. The three causes enumerated are dealt with in detail with reference to their differential diagnosis and treatment.—*Edinburgh Med. Jour.; Med. and Surg. Reporter.*

NITRATE OF SILVER IN THE TYMPANUM.

F. W. Bennett offers a word of caution against the use of silver nitrate in the tympanum. In one case the instillation of a 20 per cent. solution was followed by intense pain, which did not yield to cocaine or the local and hypodermic use of morphia. The deafness

became absolute, and there were frequent attacks of transient vertigo. After the use of leeches and potassium iodide the symptoms subsided, and the hearing gradually returned.—*Lancet*, February 4, 1888.

CAPACITY OF THE EXTERNAL AUDITORY CANAL

The average capacity of the external auditory canal in 100 soldiers, measured by Hummel, was 1.07cc. on the right side and 1.05cc. on the left. In general, it increased with the length of the body.—*Arch. Ohrenh.*, xxiv, p. 263.

NITRO-GLYCERINE AND TINNITUS AURIUM.

Lautenbach, in a casuistic of cases of tinnitus aurium, to which he had given nitro-glycerine experimentally, "found it most serviceable in patients having the tinnitus aurium without much impairment of hearing, and where but little change had occurred in the naso-pharynx, and where it was found on examination that some abnormal condition of the heart existed, either functional or organic." Catarrhal otitis media and follicular pharyngitis were generally present. A dosage of gr. $\frac{1}{100}$ *in die* was given, and increased to the point of diminishing the tinnitus, or production of headache.—*Phila. Med. Times*, January 1, 1888.

"VERTEBRARTERIAL" PRESSURE IN RELATION TO PULSATING TINNITUS AURIUM.

J. Dundas Grant communicates the following observation: "The fact is well known that the arterial supply of the labyrinth comes by the internal auditory artery from the basilar, which is the continuation of the conjoined vertebrals. It follows from this that if pulsating tinnitus is, as described by Woakes and others, the result of labyrinthine congestion, it ought to be checked by pressure on the vertebral arteries. By pressure, exerted by means of the thumb and finger in the hollows behind the mastoids and the transverse processes of the atlas (corresponding to the space bounded by the rectus capitis posticus major, the obliquus superior, and the obliquus inferior on each side), I found I could check *pulsating* tinnitus in a large number of cases. In order to make sure that my pressure really acted on the vertebral artery, I took the opportunity, afforded me by the kindness of Dr. Charlewood Turner, of testing the fact on the dead body under his observation. Water was forced through the vertebral artery from below by means of a syringe, and we found that its *outflow through the cut end of the basilar was completely stopped when I exercised pressure as I have described.* It is easy to find the exact points on which to exercise pressure on any patient suffering from tinnitus from salycin or quinine.

"I employ this process as one means of diagnosing cases of laby-

rinthine congestion, in which I agree with Woakes (of whose views this experiment is the natural sequel) in believing hydrobromic acid a valuable remedy, but I do not believe it better than the potassium, sodium, or ammonium salts of that acid; and in fact I prefer, as a rule, the salts, either singly or combined. Therapeutically, the "vertebrarterial" pressure may be employed as a temporary palliative capable of giving relief of some duration even after removal of the pressure; and in order to keep up the pressure for a lengthened period I have several times used pyramidal pads of cork, wrapped in lint and pressed into the hollows by means of a strap or tourniquet passing round the forehead."—*Brit. Med. Jour.*, December 24, 1887.

OBJECTIVE TINNITUS.

Dr. J. B. Girould records a curious case of objectively percei.able tinnitus. The sound is like the ticking of a watch, about 160 beats in the minute, and can be heard some six feet from the patient. Observation was continued six months, and, although the sound occasionally intermits for a few minutes, there is no relief except in sleep. Audition was intact. There was some dyspepsia and an obscure nervous disorder, characterized by spells of trembling upon slight exertion. Girould attributed the tinnitus to movements of the ossicles, although no motion of the membrana tympani was visible.—*Boston Med. and Surg. Jour.*, February 2, 1888.

OTITIS FROM INFECTION.

An excoriation in the canal may admit the micro-organism, and upon the malignity of the latter depends the severity of the symptoms. Hesler reports seventeen cases. There were rigors, fever, prostration, and great swelling around the ear,—especially in front and behind. The diagnosis is not always easy, especially when an infectious otitis is engrafted upon some other inflammation, which, as Kessel and Katz have pointed out, may be brought about by lack of care in the use of specula. Often the patient himself indicates the cause. It is often difficult to differentiate from a furunculosis, but is to be suspected if an apparent furuncle fails to suppurate. An incision performed in two cases brought blood, but no pus; but acted favorably by the depletion of the tissues. Local depletion, hot and cold applications, and incision are often without result. To relieve the intolerable itching are recommended, local baths of sublimate or, preferably, of absolute alcohol.—*Rev. Mens.*, etc., February 1, 1888.

PNEUMOCOCCI IN ACUTE OTITIS MEDIA.

In a letter to the *Ann. des mal. de l'oreille*, etc., Dr. H. Chatelier reports the bacteriological investigations of Zaufal, in middle-ear catarrh with exudation. In the fluid drawn from the tympanum were

found exclusively the microbes described respectively by Friedlander and Fränkel in pneumonia,—that is to say, a large, short, encapsuled bacillus, and a diplococcus, also encapsuled. These microbes appeared in the exudation (with respect to other bacteria) in a state of pure culture. Each of these two in turn was isolated by the modes of cultivation ordinarily in vogue in bacteriological researches. An emulsion of the bacillus in a solution of sodium chloride instilled into the nasal fossæ of a mouse killed the animal. The autopsy showed a pronounced meningo-encephalitis, which Zaufal believed to have taken place without irruption of the cranial envelope, but there was no otitis media. The bacillus was found in the blood and spleen, large and short, and encapsuled. A rabbit and gray mouse suffered no ill consequence from the inoculation of the diplococcus in pure culture, and the same was true of a mouse inoculated with the fluid which continues to ooze from the tympanum after paracentesis. It is very possible that an acute otitis should have origin in the pneumococcus (resp. bacillus) and that the latter should disappear when suppuration is established. Zaufal found the microbes in question only before spontaneous perforation had taken place, although Netter pictures the encapsuled pneumococci which he observed in a purulent otitis occurring in the course of a frank pneumonia. On the other hand, he found a streptococcus in the purulent meningitis from caries of the petrous portion of the temporal bone.—*Ann. des mal. de l'oreille*, etc., January, 1888, No. 1.

LARYNGOLOGY AND RHINOLOGY.

UNDER THE CHARGE OF

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THE DANGERS OF HEMORRHAGE AFTER TONSILLOTOMY.

Blair, of Albany, describes two cases of hemorrhage after tonsillotomy in which the bleeding was "not only very profuse but also alarming, and required considerable time and careful manipulation to control it." In the first case three parenchymatous injections of a 10 per cent. solution of cocaine were made to induce anæsthesia and control the bleeding. The operation, performed with a Mathieu tonsillotome, was followed by no untoward result in the right tonsil, but as soon as the left tonsil, which was hard and fibrous and attached to both arches of the palate, was cut, profuse bleeding occurred. A 20 per cent. solution of cocaine arrested it momentarily, but it soon returned, when ice, nitrate of silver, tannic acid gargles, Monsel's solution were used without effect. Pressure finally succeeded to arrest the flow for

some hours, when it reappeared, to be again arrested for a time. The third hemorrhage was again arrested by pressure, an ice poultice being also applied to the angle of the jaw.

In the second case, in which a parenchymatous injection of 20 per cent. solution of cocaine was also used to produce anæsthesia, the hemorrhage occurred as soon as the tonsil was cut. To quote the author's words, "Just as the tonsil was severed the blood came welling out of the mouth and in a stream, and, for the moment, I believed that a large vessel had been severed. The patient could not empty his mouth of the blood as fast as it would fill." Pressure, kept up for some time, followed by the same list of remedies as in the preceding case, being of no avail, continued pressure was again resorted to and maintained four hours, when the bleeding was found to be controlled.

While appreciating the value of cocaine in producing anæsthesia and temporary anæmia of the parts, Blair is inclined to ascribe the hemorrhage in these cases to the use of that drug, the secondary paresis of the vessels causing them to remain open.

In the discussion following the paper, which was read before the Medical Society of the County of Albany, two unpublished cases of very severe hemorrhage were alluded to.

In this connection, Dr. G. Sterling Ryerson, of Toronto, formulates the following rules which, he believes, have kept him out of a great deal of trouble:—

(1) Never remove a tonsil at a patient's house.

(2) Never operate without means of arresting hemorrhage at hand.

(3) Never operate on adults if this can be avoided.—*Albany Med. Annals*, February and March, 1888.

BENZOATE OF SODIUM IN ACUTE FOLLICULAR TONSILLITIS.

L. C. Boislinière, Jr., of St. Louis, in an analysis of seventy-five cases, found that by the use of benzoate of sodium, acute follicular pharyngitis was cured in from twelve to thirty-six hours, whereas the average duration of the disease by other treatments is from two to five days. When the cases could be watched carefully, as in private practice, the white, cheesy spots were frequently seen to disappear in from eight to ten hours. The drug undoubtedly controls the febrile elements of the disease. Having never encountered disagreeable effects from even large doses, he considers that it may be given with impunity even to children. The formula employed is the following:—

℞ Sodii benzoat, ... ℥i–iv.
Glycerine,
Elix. calisayæ, ... āā ℥j.

M. S.—One teaspoonful every one or two hours.—*St. Louis Courier of Med.*, February, 1888.

THE TREATMENT OF TONSILLITIS BY SALICYLATE OF SODIUM.

Hillaby, of Pontefract, England, recommends salicylate of sodium in the treatment of tonsillitis in the highest terms. In his hands, it speedily reduced the fever, the action of the skin was increased, resolution of the inflammatory process was hastened, and the formation of abscess was averted. He first opens the bowels freely with mistura sennæ co. (Br. Ph.), places the patient on a milk diet, and administers the following draught:—

℞. Sodii salicylatis, ... gr. x–xv.
Tincturæ aurantii cort., ... ♏x.
Aquam, ... ad ℥j. M.

This is administered every four hours until the inflammation begins to subside, when the dose of salicylate is reduced, and continued to be given until disappearance of all symptoms.—*Practitioner*, April, 1888.

TREATMENT OF DIPHTHERITIC PHARYNGITIS.

After expressing his firm belief in the local origin of diphtheria, Gaucher, of Paris, reports sixteen cases of undoubted malignancy in which separation of the false membrane from its base, followed by cauterization of the spot with carbolized camphor (a preparation suggested by Soulez, of Romorantin), resulted in recovery in every case.

Soulez's preparation is composed of pure carbolic acid, 9 grammes (℥ij and gr. xv); alcohol, 1 gramme (♏xv); and camphor, 25 grammes (℥vj and gr. xv), thus making a little over one ounce of carbolized camphor, to which is added an equal quantity of oil of sweet almonds.

Although admitting that cauterization is by no means a novel method in the treatment of diphtheria, nitrate of silver, hydrochloric acid, etc., having been used, Gaucher considers his method a new one, because it adds the antiseptic element to the treatment,—a most important feature. The objection to cauterization, that denudation of the epithelium opens the door to infection is thus obviated, the infectious germ being destroyed by the antiseptic agent.

A brush or a piece of wood, to the end of which a piece of cotton wadding has been carefully attached, is used to detach the false membrane and to make the application. The mouth being widely opened (held so by a gag in small children), the brush or cotton carrier is dipped in the carbolized camphor (care being taken to avoid drops), then carried to the diseased spots, each one being carefully denuded of its false membrane and thoroughly cauterized.

The operation is sometimes very painful, and deglutition is impaired for a short while, although the dysphagia is not greater than in a severe case allowed to proceed. The inflammatory reaction, however, is not as great as one might imagine. The urine may also become

dark colored through elimination of the absorbed acid. No symptoms of poisoning having ever appeared, the advantage of this absorption in counteracting general infection is obvious.—*Archives de Laryng. et de Rhinol.*, December 15, 1887.

TREATMENT OF TUBERCULOUS LARYNGITIS.

Hunt, of Liverpool, considers the disease as a local one, due to infection from the sputum, the tubercle bacilli penetrating the membrane when its powers of resistance are diminished, especially at points of superficial erosion. He admits that there is also a primary form, which is, however, very rare. In the stage of anæmia, Hunt recommends stimulating applications, a chloride of zinc solution especially, but deprecates solutions of nitrate of silver. The mineral astringents, of which the perchloride of iron is considered the best, are advocated when simple catarrh coexists, while a solution of perchloride of mercury, 1 in 2000, is suggested to prevent this simple catarrh from becoming tuberculous by infection. During the stage of infiltration astringents are not indicated, as they might do harm by hastening ulceration. In ulceration, lactic acid had given the best results, while iodol had been found quite as useful as iodoform, and much more agreeable to use. The healing of the laryngeal ulceration should be supplemented by hygienic and constitutional treatment, extending over years, or recurrence was certain to occur.—*Medical Press and Circular*, March 28, 1888.

THE LACTIC ACID TREATMENT OF TUBERCULOUS LARYNGITIS.

Hering, of Warsaw, in a report read before the Sixtieth Meeting of German Naturalists, gave a list of 15 cases treated with lactic acid, in 11 of which complete cicatrization of the laryngeal ulcerations had resulted. Some of these cases had been over two years, and no recurrence had presented itself. Hering admits, however, that lactic acid cannot be used in all cases, being positively contra-indicated in some.

He also used the sharp curette to clear the interarytenoid space of all tuberculous growths, and in deep tuberculous ulcerations. All the cases presented the characteristic bacilli in their sputum.—*Rev. Mens. de Laryng.*, January, 1888.

HOT-WATER IRRIGATION IN EPISTAXIS.

In a severe case of epistaxis, in which the blood forced its way through the lachrymal puncta and through the plugs, Alvin, of Mont Dore, after removing the latter, injected water heated to about 155°F. The bleeding was checked after a couple of minutes, the operation being painless, notwithstanding the high temperature of the water.—*Paris Letter in American Lancet*, February, 1888.

HEMORRHAGIC PHARYNGITIS.

Under this title Jamison, of London, considers a symptom frequently met with in cases in post-nasal catarrh,—red-stained expectoration,—and calls attention to the fact that it frequently misleads competent physicians in the belief that the condition is due to the initial stage of consumption, and affords ample opportunity for quacks to reap rich harvests.

Jamison does not ascribe the symptom to catarrh, however, but believes it to be of hepatic origin, associating it with the epistaxis met with in childhood, occurring as a symptom of hepatic disturbance. This opinion was based upon the fact that there was a firmly continuous history of biliousness and liver engorgement in his cases, suggesting that the "pharyngeal hemorrhage, of a passive character, replaced the ordinary rectal leakage." He further substantiates his opinion by the results obtained by treatment, astringent pigments and sprays, chiefly of iron and tannin, having afforded no relief. Most benefit was obtained by painting the pharynx with a solution of carbolic acid and glycerine (℥ss. to ℥j.) and pastilles of chlorate of soda. As most of his cases were men of a flabby condition in addition to their biliousness, he advised a combination of nitric acid and extract of bark, continued for several weeks, adding a little tincture of nux vomica if much flatulence troubled the patient.—*British Medical Journal*, April 21, 1888.

COCAINE IN TRACHEOTOMY.

Lennox Browne states that since the introduction of cocaine, neither he nor his colleagues at the Central London Throat and Ear Hospital have employed chloroform when performing tracheotomy, substituting for it five minims of a 10 per cent. solution of cocaine on each side of the immediate region at which the trachea was to be opened. Ten or twelve minutes were allowed to elapse before commencing an operation, and in the majority of instances pain was not felt during any stage of the operation. Besides its local action as an anæsthetic, cocaine used in this manner has the effect of diminishing hemorrhage during the operation by contracting the blood-vessels, whereas with ether or chloroform the contrary is produced. It also quiets the breathing and steadies the larynx in cases in which the respiration is seriously hurried.

Lennox Browne's experience with cocaine in tracheotomy, covering forty cases, in hospital and private practice, and the fact that he saw but one case in which the toxic action was at all observed, which was at once remedied when the trachea was opened and a full flow of air admitted into the lungs, would greatly militate in favor of the employment of the drug in the manner described.—*British Medical Journal*, April 7, 1888.

ANTISEPTIC CANULA IN TRACHEOTOMY.

A comparison between the death rate of 72 per cent. in the statistics of Lovett and Munro (*American Journ. Med. Sciences*), based upon 21,853 cases, and the mortality of 47 per cent. occurring in the Marburg Hospital during the past three and a half years, led Dr. Karl Roser, of that institution, to ascribe the greater success obtained by him to a measure which he has devised to render the tube antiseptic. A piece of gauze a little over half an inch in width and about three inches in length is dipped in a sublimate solution. While still moist, powdered iodoform is rubbed into its meshes, thus making the surface perfectly smooth. When dry, the gauze thus prepared is wrapped around the portion of the canula that is to be inserted, and, becoming soft through absorption of moisture, it renders aseptic all the parts with which it comes in contact, especially the exposed surfaces of the incised tissues.

Roser generally leaves the first canula *in situ* not less than a couple of days, then substitutes another prepared in the same way. This is in turn left three days in place, after which secondary infection is not likely to occur. An ordinary canula can then be substituted.—*Deutsche Med. Wochenschrift*, 1888.

GENERAL SURGERY.

UNDER THE CHARGE OF

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SUCCESSFUL REMOVAL OF A TUMOR OF THE SPINAL CORD.

Recently a private patient of Dr. Gowers and Mr. Victor Horsley was good enough to allow the members of the Medical and Chirurgical Society of London to see how much he had been benefited by the removal of a tumor from his spinal cord some time before. He had suffered most severe pain for about three years. Its maximum was felt just below and inside the angle of the left scapula, and was accompanied by absolute loss of sensation and motion of the body and limbs below that level. The upper border of anæsthesia was distinctly in the region of the fifth intercostal nerve of the left side, whilst on the right side it was less accurately defined, but extended no higher.

All the symptoms pointed to tumor of the cord, and the agonizing character of the pain made an attempt to remove it justifiable.

Horsley therefore removed the spines and portions of the lamina of the fourth and fifth dorsal vertebræ. No tumor was to be found; but upon similarly treating the third vertebra a small oval myoma, compressing and making a deep groove in the left side of the cord, came into distinct view and was easily shelled out of its bed.

A drain was left in the upper part of the wound in closing it, and from this flowed small quantities of cerebro-spinal fluid for some days, but the wound healed rapidly and without constitutional disturbance.

The previous intense pain continued without abatement for a month, but after that it gradually and intermittently decreased until at the date of exhibition, seven months after the operation, it had entirely disappeared, while sensation and motion of the body and legs had almost completely returned.—*British Medical Journal.*

SUB-PUBIC LITHOTOMY.

Under name of "Sectio alta Sub-pubica," Langenbuch described to the late seventh meeting of German surgeons a novel theoretical operation upon the male bladder.

Supra-pubic cystotomy and lithotomy have been his favorite operations to reach the bladder, but the many dangers which he considers to be run whilst accomplishing them has induced him to propose the new operation, which he would perform as follows: A cross-shaped incision is to be made between the root of the penis and the pubic bone in such manner as not to involve the corpus cavernosum or dorsal vein of the penis. This incision is then to be carried downward toward the bladder until the venous plexus at its neck comes into view. This latter is to be pushed aside, when, if additional room be required the lower portion of the pubic bone may be chiseled away. After this, or without it, the bladder is to be incised. It can then be readily explored by the finger, etc., and any foreign body removed. For drainage he proposes to make a counter-opening through the perineum; through it a drain-tube is to be placed, while another occupies the sub-pubic wound.

This operation has never been performed upon the living body, so remains purely theoretical and probably with but a very limited chance of adoption save under exceptional circumstances.—*Med. and Surg. Rep.*, January 14, 1888.

SEAT OF GONORRHŒAL INFECTION IN WOMEN.

Starting with the supposition that the gonococcus of Neisser is necessary for the demonstration of infection, Steinschneider, of Franzensbad, has investigated the seat of gonorrhœal infection in women.

Among these were 20 cases without any symptom of gonorrhœa,

34 cases of fresh infection, and 3 cases in which the disease had existed for months, where secretion from the urethra had ceased.

In the 34 fresh cases characteristic aggregations of gonococci were found in the urethral secretion, and from this the author concludes that in all recent cases of gonorrhœa there exists gonorrhœal urethritis. He also, however, recognizes a non-specific urethritis in the female.

Gonococci were traced to the secretion of the vulvo-vaginal glands in but a single instance: here bartholinitis and urethritis existed.

The most frequent seat of infection was found to be the cervical mucous membrane. Gonococci were found in this situation in about half the cases examined.

Out of 16 cases examined, in but 4 were gonococci discoverable in the uterine cavity. In the vaginal secretion of 34 examined cases *no* gonococci were discovered.

From this study the author concludes that the gonococci do not make their abode in the mucous membrane of the vulva and vagina, but in the urethra, cervix, vulvo-vaginal glands and ducts, and occasionally in the uterine cavity itself; also that gonococci may long since have disappeared from the urethral secretion, yet still be abundantly present in the cervix and corpus uteri, but that their presence in these latter locations is not of necessity connected with a continuance of inflammatory action in those portions of the genital apparatus.—*Berliner Klin. Wochenschr.*, December, 1887.

IRRIGATION OF JOINTS.

A large collection of cases, principally of the knee, have been collected from the records of the Hamburg General Hospital and reported in the *Deutsche Zeitschrift für Chirurgie*, xxvii, 1 and 2, by Hager.

The method of irrigation is conducted by means of a trocar or aspirating needle, through which first the liquid contents of the joint are withdrawn, and, secondly, the cavity is well distended with 3 to 5 per cent. solution of carbolic acid. This is withdrawn by the same means and fresh solution reinjected several times, the joint being so manipulated each time that the fluid will reach every portion and recess. When the fluid returns perfectly clear enough, washing has been accomplished. The usual splint is applied for a few days, when all dressings are laid aside and passive motion with massage commenced and continued for a couple of weeks, after which simply a flannel bandage is worn. If any reaccumulation has taken place at the end of six days, they are reapplied for another week, and more firmly, before passive motion is instituted.

Hager gives a series of 100 dropsies of the knee-joint so treated, all of which recovered with useful limbs save one,—a tuberculous

subject. In four of this series the operation had to be repeated before cure resulted.

Another series of 25 cases of acute character recovered, as did the chronic ones in an average period of two weeks under same treatment.

Seventy-five subacute or chronic knee-joint cases were similarly treated, and all but 11 cured in a little more prolonged period of time.

Four of the other 11 had lateral motion; the remaining 7 required forcible breaking up of the joint. Ten cases of hemiarthrosis all promptly recovered after irrigation, and with perfectly movable joints. In 15 cases where simple washing out was performed for suppurative knee-joints, all recovered, 4 had perfect motion, 5 had limited motion, and 7 had no motion, but good anchylosis. Fourteen times was the same joint punctured and irrigated for tubercular inflammation; one of these had perfect motion, the remainder recovered, with more or less complete anchylosis.

Seven instances of acute primary suppuration resulted, after the same treatment, in 4 absolute cures and 3 cases of anchylosis.

Four cases of suppuration of various joints consequent upon infectious diseases resulted in perfect recovery.

Fifteen cases of gonorrhœal inflammation of joints treated in the same way gave 7 absolute recoveries, 5 almost so, limited motion in 1, and anchylosis in 1.

Twelve examples of rheumatic arthritis operated upon—11 of the knee, 1 of the elbow—resulted in perfect motion in 9 and almost so in the other 3.

It therefore is seen that 168 cases of all classes were operated upon by the method of antiseptic irrigation or flushing, and that all recovered,—the great majority with perfect motion; the next greatest number had useful limbs, while those few resulting in absolute anchylosis almost complete the number; one or two were not benefited, and probably underwent other operative treatment later.

ICHTHYOL IN SURGERY.

Martin reports the results of a limited clinical study of ichthyol in its surgical applications.

The drug is described as a powerful antiphlogistic, which effect its combinations retain to a marked degree.

Lartingeau employs it for all subcutaneous and inflammatory tumefactions, œdemas, vascular dilatations, incipient furuncles, and local rheumatic affections; Elliot, for burns of the first and second degree (5 per cent. solutions), also for varicose ulcers associated with eczema, and for vicious cicatrices; Schweninger, for all local non-inflammatory painful affections, believes ichthyol to act more powerfully than any other remedy. Other German surgeons have

been most, perhaps too, extravagant in praising the powers of the drug. Nussbaum and Lorenz especially favor its use.

Martin used in his study cases a 10 per cent. ointment of ammonium ichthyolate in lanolin. Upon analysis of his results he concludes that the drug is markedly—sometimes almost miraculously—useful in (1) affections characterized by inflammatory enlargement, and (2) affections characterized by pain of peripheral origin probably dependent upon inflammation or congestion.

The theoretical antiphlogistic action of the drug would therefore seem to be supported by the practical working of the remedy. The strength of the application must depend upon the state of the surface to which it is to be applied. He records in detail a remarkable cure of erysipelas of the scalp under applications of the ichthyol ointment. —*Polyclinic*, March, 1888.

TRANSPLANTATION OF BONE.

H. M. Sherman briefly reviews this important and interesting subject, and reports two apparently partially successful cases.

He regards the following points of importance: That a perfectly healthy bed of granulations must first be secured,—preferably by means of iodoform gauze packings. The grafts should be taken from the bone of some young and rapidly-growing animal, and from as near an epiphysis as possible, that the utmost vital action may be secured. They should consist of both bone and periosteum, and perhaps even cartilage of ossification may be of advantage. Their maximum size should not exceed one-third of an inch in length and one-quarter inch in breadth. Grafting has been successfully done with human, kid, and dog bones. These are probably the best sources. The grafts should be so planted that they will have free vascular connections on all sides, for such was their condition before transplantation. This may be accomplished by incisions into granulation beds. The grafts must be held down by *moderate* pressure, so that they shall not be forced from their location by newly-forming granulations.

Strict, but not too powerful, antisepsis should prevail, so that the discharges may be kept at a minimum and sweet.

The dressings should not be changed more often than is necessary to secure this desideratum; hence should be large and very absorptive. —*Pacific Medical and Surgical Journal*, January, 1888.

NEW OPERATION FOR CARCINOMA OF THE STOMACH.

In the December number of the *Annals of Surgery*, Bernays, of St. Louis, details a new palliative measure for the temporary relief of cancer of the stomach.

The operation, which he has several times successfully performed, is described as follows: Gastrostomy is preliminarily performed.

The wall of the stomach having then been carefully secured to the abdominal parietes, it is opened by an incision an inch and a half long. The lips of the gastric wound are then carefully attached to the skin of the belly by multiple silk sutures. First, the organ is washed out with warm solution, then the neoplasm is torn, broken, or scraped away as thoroughly as possible by means of fingers, curettes, etc., and subsequent bleeding controlled by a stream of iced carbolized water.

His first case was twice operated upon with great subsequent relief each time, whilst in his second the woman had gained twelve pounds in three months.

SURGERY OF ABDOMINAL COMPLICATIONS OF TYPHOID FEVER.

T. S. K. Morton recorded, some time ago (*Medical News* for November, 1887), a case of perforated typhoid ulcer operated upon in an imperfect manner by Bartleet, of Birmingham; also abstracts of a German report of a similar case operated upon by Kussmaul in 1885, both of which speedily terminated fatally. He then dilated at length upon the diagnosis, etiology, and prognosis of such and other abdominal complications of the fever, concluding that perforation or rupture of an abscess into the perineum, if neglected, are practically always fatal, and that *diagnosis* being made out—sometimes even without it—remedial operation should be performed at the earliest possible moment. The method of operation suggested was: thorough cleansing and precautions against shock, cautious handling throughout, antisepsis, median incision, systematic search for lesions, beginning from the cæcum to the stomach first, and from the cæcum to the rectum afterward, then the other abdominal organs in order; Lembert sutures for perforations, or, if very extensive, excision of a portion of bowel, or even artificial anus if necessary; the turning into the bowel-lumen, by means of Lembert sutures, of all ulcers which seem likely to perforate later; immense irrigations of the abdominal cavity with hot water before closure, and glass drainage to the pelvic floor,—the whole process to be repeated upon subsequent perforation of another ulcer, etc.

In the same journal shortly afterward appears (December, 1887) the history of a case of perforated typhoid ulcer operated upon by Thomas G. Morton. The patient was a man aged 23, of splendid physical development, in the third week of typhoid fever.

His was what is commonly termed a "walking case" of that disease, and he had scarcely been in bed at any time until the last day and a half previous to his sudden death. His physician had even ceased visiting him regularly, and for several days his temperature had been scarce above normal. At that time, feeling very well, during absence of his family he partook of a hearty meal. A few hours afterward, he was seized with excruciating pain in the right lower portion

of the abdomen, followed shortly by a violent chill and rapid rise of pulse and respiration rate.

Dr. Morton saw the patient in consultation twenty hours afterward, positively diagnosed perforated typhoid ulcer, and, although his condition was very poor, urged abdominal section as the man's only chance. Operation was immediately done in precise conformation with the above-recommended method. About three feet above the valve a perforation three-eighths of an inch in diameter was discovered occupying one extremity of an ulcerated Peyers patch. This lesion was repaired by turning the whole area of ulceration into the bowel-lumen by means of Lembert sutures. These were started into the outer coats of the bowel about three-sixteenths of an inch from the edge of the ulcer, brought out again about one-sixteenth of an inch from that edge, then introduced in like manner upon the other side of the ulcer, paying no attention to the bowel- and ulcer-tissue between. When these sutures were tied the perforation, ulcer, and bowel-tissue below it turned into the lumen of the bowel, whilst peritoneal surfaces came into contact above. This done, and the remaining portions of the intestines, etc., having been examined, attention was directed to a necrotic-looking ulcer which was observed not far above the cæcum. The ulcers were all outlined upon the peritoneal surface by deep, dusky red, slightly swollen areas corresponding to their outlines. The one especially referred to presented in a portion of its area a grayish aspect, as if of spachelus. It was thought prudent, in view of probable perforation at this point, to turn the whole area into the bowel-lumen with Lembert sutures. Patient succumbed seven hours after operation.

Post-mortem.—Three inches above the valve was found the ulcer which had looked necrotic at the time of operation, and three feet nearer the stomach was found the repaired perforation. Both were in excellent condition.

No additional lesions were discovered, and even when the intestine was forcibly distended no leakage or rupture occurred. It is interesting to note that an examination of the specimens of the above case showed that, although a considerable amount of tissue had been turned into the bowel in two places, no undue or marked diminution of calibre of the bowel was found, for the lumen of the bowel at the points of suture, when only very moderately distended, was at least an inch.

Bontecou, of Troy, also reports a case of ruptured typhoid ulcer upon which he operated, but likewise without success. The patient was a man aged 25. Perforation took place on the 15th day of disease, operation upon the 17th. Man then in collapse, and operation only undertaken as a last, though desperate, chance. General peritonitis, also two intestinal perforations were found. One of the latter

was at the root of the appendix, the other ten inches above the cæcum. The appendix was ligated and cut off, while the lesion of ileum was repaired by means of Lembert sutures. The patient died before coming out of ether.—*Jour. Am. Med. Assoc.*, January 28, 1888.

Still another instance of surgical interference with typhoid surgical complications is given by Carl Lauenstein, of Hamburg,—a case upon which he successfully operated for typhoid embolic abscess of the spleen. A man, æt. 23, was admitted to the hospital on the fourteenth day, of typhoid fever. Abdomen somewhat tympanitic, splenic dullness very much increased in all directions, but the organ was not palpable through the distended abdominal wall. Pain in splenic region, but no tenderness. Chill on third day after admission, with blue lips and high fever, together with great increase of pain in splenic region, which latter had much increased in area. Upon the following day patient went into collapse, from which he was aroused by free use of heat and stimulants. Pain continued in the splenic region, and Lauenstein diagnosed abscess of that organ and proceeded to operate. After anæsthesia an aspirator needle was introduced about the middle point of splenic dullness. Nothing came at first, but upon slightly withdrawing the instrument a small amount of brown pus flowed from it. The needle was kept in place whilst a portion of the ninth rib was exsected and a cautery carried in until, at a depth of an inch, the pus-cavity was entered. The spleen incision was then extended to the limits of the external wound, and its borders were secured to the latter by means of hooks. A finger was introduced and the cavity found to be the size of a small orange. Loose fragments of spleen were removed from it, and, after thorough irrigation with salicylic solution, the cavity was tamponed with strips of iodoform gauze. The patient had no symptoms after operation save those incident to typhoid fever. Two months afterward he was discharged cured, with his wound healed and splenic dullness not much greater than the normal.—*Deutsche Med. Wochenschrift*, No. 51.

VON BERGMAN'S TREATMENT OF WOUNDS.

Bramann has recently given the method and results of the treatment of wounds in the surgical clinic of von Bergman. Although these methods are of very different form from those in vogue in this and other countries, and the results can scarcely be better than those attained elsewhere, but more especially in America, yet those of the German surgeon would seem in many cases to subject the patient to much more discomfort, manipulation, and pain at the very least. Gauze is almost universally employed. It is sterilized by running steam at 212° F., and after being dried is impregnated usually with corrosive sublimate or iodoform. The simple sterilized gauze is

used in all small, simple, and non-exudative wounds. For wounds from which is expected more profuse secretion the corrosive gauze is employed. All cotton, sponges, instruments, and other appliances coming in contact with the wound are likewise simply sterilized by running steam. Steam-sterilized sutures of silk are used on the surface, but catgut is used out of alcoholic solution of bichloride and water for deep, relaxation sutures and ligatures. The patient is prepared for operation by means of full baths, local shaving and cleansing with soap, water, ether, and a final douche with 1–1000 to 1–200 corrosive sublimate solution. Instruments are used out of three per cent. carbolic acid solution. The wound is from time to time during the operation douched with 1–2000 corrosive sublimate solution, but in all abdominal, bladder, mouth, and rectal operations salicylic acid 1–1000 or boracic acid 1–200 is employed. The wound is usually at the end of operation given a coating of iodoform crystals by means of squirting a jet of saturated solution of that drug in ether over the exposed surfaces. The greatest care is taken to thoroughly arrest even the most minute bleeding points, as, next to antisepsis, this is regarded as the most important agent in attaining primary union.

After hemorrhage has finally been absolutely arrested the wound is carefully sutured with or without drainage, as the case may be; provided that it is known to be thoroughly aseptic. In those cases in which it is impossible to absolutely arrest hemorrhage, or which are known or suspected not to be thoroughly aseptic, the wound is loosely packed with strips of iodoform gauze, several feet in length and as many inches broad, whose ends hang out of the angles of the wound. At the end of that time the patient is again etherized and the necessary sutures introduced. Up to this time the tamponed wound is kept well covered in with large amounts of corrosive gauze and cotton and retained by a gauze bandage, which may be changed at any time during the next two days that it may become saturated with exudation; but the iodoform strips are invariably allowed to remain throughout the whole two days. It is then removed by gentle traction on the outhanging ends, when the wound is usually found clean, unirritated, and absolutely dry. Invariably careful suturing has resulted in primary union. Drainage is occasionally necessary; but even with this, or in cases where on account of hemorrhage from large vessels the tampons are allowed to remain for six days, primary union after suturing is the almost invariable rule.

SUBCUTANEOUS BLOOD AND SALINE INJECTIONS.

Von Ziemssen recounts a long list of dangers which he thinks most grave and frequent in the performance of, and after, the usual intravenous injection of defibrinated blood, which certainly has not

been the experience of those American surgeons who have most frequently performed the usual operation.

He, to avoid the mentioned risks, has proposed to substitute for it the subcutaneous injection of well defibrinated and aseptic blood. That the latter may be secured the greatest antiseptic and aseptic precautions are necessary. The blood is maintained at a temperature of 100°–104° and is slowly injected from an ounce syringe into the subcutaneous connective tissue. The upper third of the thigh is the favored location for injection. Massage is an almost vital part of the operation, and must be thoroughly done at once upon withdrawal of the syringe. Massage is so painful after large quantities have been injected that anæsthesia is necessary.

Each new syringeful must be injected in a new place: he has thus injected more than ten ounces in fourteen injections at a single sitting. The procedure has been proved entirely without danger when rightly performed. Twice with von Ziemssen suppuration has followed careless *technique*. The subcutaneous connective tissue acts as a filter, arresting coagula, air-bubbles, and ferments, but permitting the red corpuscles to pass freely through. Even a few days after injection no traces of free blood can be found at the site of injection, whilst increase of hæmoglobin in the circulation is demonstrable, sometimes as much as doubled. Coincident increase of red corpuscles slowly occurs, and if the injections are sufficiently often repeated both corpuscles and hæmoglobin may occasionally be brought up to the normal.

He has seen severe cases of anæmia recover by this method of treatment in a month, and thinks it indicated in even acute anæmia from hemorrhage, although when death is at all imminent salt injection may be employed to tide over the emergency and prevent emptying of the blood-vessels and destruction of the heart's pumping power.

Saline injection should, however, always be shortly followed by subcutaneous blood injection.—*Klinische Vorträge*, No. 3, 1888.

ANATOMICAL PREDISPOSING CAUSE OF POTT'S FRACTURE.

The *American Journal of the Medical Sciences* (April, 1888) contains an interesting contribution to the etiology of Pott's fracture in man, by J. Bland Sutton, of London. His object is to prove that causes other than that of civilization are responsible for the remarkable predisposition of the fibula to break at a point three inches above the ankle, whilst the tibial malleolus is splintered off or the deltoid ligament ruptured and the foot everted—that aggregation of conditions which make up what is recognized as the fracture described by Pott.

He finds that if the malleoli of man be compared with those of other animals, even the ones which most nearly approach him in anatomical characters, the human differ from the others in that the internal or fibu-

lar malleolus descends much below the internal or tibial, whilst those of the other even closely allied animals simply descends to the same level.

Further, he quotes from Gegenbauer that in the human fœtus during the fifth month of intrauterine life the tibial is the most prominent malleolus; that in the seventh month they are of equal length, and from this date onward the fibular gradually exceeds the tibial malleolus in length; and that in man the preponderance of the fibular malleolus gives greater firmness to the ankle-joint, and has probably been acquired through assumption of the erect posture.

As far as Sutton is aware, no one has described a Pott's fracture occurring in an animal, nor has he seen one himself, although many other forms of leg fracture in animals have passed under his observation. Hence, he assumes that Pott's fracture is peculiar to man and occurs as a direct result of the extreme length of the fibular malleolus, in that it affords excessive leverage when the foot is twisted suddenly and violently laterally; the force applied to the distal end causing the fibula to snap at some point in its lower fourth. His investigations confirm the observations of Parker and Shattock, that in cases of congenital varus the malleoli preserve their fœtal condition of being on a level. The elongation of the fibular malleolus he regards as probably resultant of man's assumption of the upright position, and while it is of greatest advantage to the maintenance of that position, yet it is accompanied by the serious inconvenience of predisposing him markedly to the occurrence of fracture.

TRAUMATIC ANEURISM OF INTERNAL PLANTAR ARTERY FOLLOWING TENOTOME WOUND.

Walsham gives the history of a case in which aneurism occurred in this unusual location, due to wounding of the internal plantar artery during tenotomy of the plantar fascia.

Rather free hemorrhage occurred at the time of operation, but was easily controlled by pressure. Upon removing the plaster-of-paris dressings, at the end of twenty-one days, a marble-sized aneurism was noticed in the sole of the foot under the puncture-mark, the pulsation of which could be controlled by pressure upon the posterior tibial artery.

It was treated by firmly bandaging upon the foot and ankle pads which pressed upon the anterior and posterior tibial arteries, and upon the tumor itself. This plan of treatment, persisted in for two months, resulted in perfect cure.

Mr. Walsham gives caution that direct pressure upon such aneurisms themselves be carefully graduated, and not too severe; as in the necessarily partial avascularity of the parts, during pressure upon the supply arteries, sloughing is very apt to result from neglect of such care.—*Lancet*, January 28, 1888.

GENERAL REVIEW OF THE STATICS OF THE NORMAL PELVIS; COMBINED OPERATIONS FOR THE RELIEF OF UTERINE DEVIATIONS OR DISPLACEMENTS.

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(Concluded from February number.)

3d. After failure of the mechanical straightening and the rupture of adhesions, shortening of the round ligaments.

4th. If there should coexist a deformity of the cervix, such as conical or hypertrophic elongation, this should be treated at the same time.

The following reports of cases are limited to a few words, so as to avoid too extended a paper. They are unpublished, and will appear *in extenso* in a longer article:—

Case I.—S. Pagen, age 27. Multipara. Retroversion with prolapsus and adhesions of the appendages; softening of the uterine tissue, and elongation of the uterine cavity; was first treated without success by restraightening, scraping, repeated dilatation, and by tampons. She was operated upon on February 11, 1887. The two round ligaments were shortened eight centimetres. Excellent results. In the month of August, having had tuberculous antecedents, she suffered anew in the region of the annexes. She had hæmoptysis and frequent cough. The genital organs, nevertheless, remained in perfect condition.

Case II.—Age 37. Multipara. General inflammation of the whole genital apparatus of four years' duration. Pruritus and trachomatous granulations at the vulva; complete retroversion; muco-purulent uterine catarrh; conical and elongated cervix; painful vulvo-vaginismus; prolonged treatment of the inflammation of mucous membrane; straightening; dilatation of the cervix. Alexander operation on April 24, 1887; proceeded by scraping, and partial bi-conical amputation of neck; result good in every respect; continuing in the month of August, 1887.

Case III.—Margerie, age 49 years. Multipara. Since two years has had metrorrhagia, extreme debility, profound anæmia. Uterus retroverted and enormous; walls very thick; no adhesions; condition such as to forbid all thought of a serious operation. The scraping showed the absence of degeneration of the mucous membrane, and caused the cessation of the hemorrhages during one month; reappearance of the flow; inefficacy of straightening and of tampons; June 16, 1887, new scraping; shortening of the two ligaments, which are very

large; arrest of the hemorrhages; rapid improvement in health; diminution of the size of uterus; complete recovery.

These three cases show the inefficiency of the straightening treatment of endometritis, and of the accessory means of treatment when employed alone; and, on the other hand, its success when combined with the shortening of the round ligaments. The adhesions were no obstacle to the success. It is indispensable to overcome their resistance by preliminary treatment.

B.—RETROVERSION, COMPLICATED WITH RETROFLEXION.

Flexion is ordinarily the result of a material alteration of the uterine tissue. It is a lesion of tissue. It is due to the cicatricial rigidity of the middle segment or isthmus of the uterus, or oftener to atrophic weakening of the same segment, under the influence of deep-seated trophic troubles. It must not be forgotten that the uterine isthmus is also the zone of vascular supply, and that any para-uterine lesion affects the circulation and the innervation of the womb.

To this trouble, which, originally external, has become parietal, there are added other changes which affect the endometrium. These are, fibroid induration of the tissue at the bend of the apex of the flexion and the fungus, inflammation of the mucous membrane at this level, or beyond the flexion, upon the declining wall,—that is to say, upon the posterior wall of the uterus. I shall not insist upon all these details, but it will suffice for me to say that,—

1st. The mechanical treatment of the retroversion will not avail if the flexion persists. This fact is proven by a large number of failures that I have noted in a previous article on the question.

2d. To cure the flexion we must all act upon the muscular tissue by exaggerated manipulation, and by the necessary and sufficiently-prolonged dilatation. Following this, the morbid tissue must be destroyed; removal, with the sharp curette, of the deteriorated mucous membrane, and above all of the indurated transverse muscular band which projects at the angle of the flexion. This treatment should precede the shortening of the round ligaments. I have had occasion to use this combined treatment in even more complicated cases, in which there also existed prolapsus. The cases will be given further on (Cases VIII, X, XII). In the following case there was retroflexion, retroversion, and elongation of a conical neck.

Case IV.—Joly, age 35. Nullipara. Uterus in a state of retroversion and retroflexion; loose adhesions; lengthening of the uterine cavity (9 centimetres); cervix long and conical; anterior border slightly everted and fungous; loose and relaxed vagina. The patient, however, being a virgin, the general atony of the sexual organs is explicable. She is, moreover, slightly nervous.

Treatment.—Uterine manipulation by two successive dilatations, restoration of the neck (scraping and abrasion), Alexander's operation. Normal and good results.

N. B.—The repeated dilatation is sometimes sufficient to cure the deviation, but in this case the want of success of the dilatation alone was marked. Patient, again seen seven months after the operation, was doing well, but she has a rather marked anteflexion. The former symptoms have disappeared.

Case V.—Mathis. Endometritis; retroflection and retroversion; prolapsus; cystocele and rectocele.

Treatment.—Scraping after preliminary dilatation; anterior colporrhaphy and posterior colpoperinæorrhaphy, with double shortening. (See elsewhere, Cases XI and XII.)

C.—RETROVERSION, COMPLICATED WITH PROLAPSUS.

That is to say, retroversion coexisting with prolapsus. I shall not return to what I have already said at the commencement of this article. As a general thing there is a decided prolapsus with marked rectocele; the cystocele cannot be seen, but if we lift the uterus, and request the woman to make an effort, the cystocele at once appears. Hence the necessity of not relying upon appearances of restoring completely the pelvic and vaginal support, and of restoring to the orifice and walls of the vagina their normal shape. Whenever I have omitted any detail of this treatment, I have had to regret it.

The following cases serve as proofs:—

Case VI.—Vézin, age 36. Multipara. Prolapsus of the third degree; uterus completely retroverted into the cavity of a marked rectocele, and forming a marked prominence at the vulva. Great elongation of womb, which doubles upon itself; the anterior vaginal wall appears normal; great posterior colpoperinæorrhaphy; maximum shortening of 11 centimetres of the left round ligament, which is very thick. Three months after the prolapsus recurs, the reverse of what it was before, —that is to say, that the neck descends under the influence of effort; but it is now the cystocele which is marked and which projects. I will in the future perform the remainder of the operation; anterior colporrhaphy and shortening of the right round ligament.

Case VII.—Hubert, age 26. Multipara. Prolapsus of the second degree; general relaxation of the vaginal walls; perineum normal; marked cystocele; the uterus leans slightly backward; it follows very nearly the pelvic axis in its descent. The woman being in an upright position, and requested to make an effort, the uterus turns farther back; endometritis; chronic catarrhal cystitis.

Treatment.—I practiced scraping, shortening of both round ligaments, and a good anterior colporrhaphy; the uterus was raised, and its

position became normal; immediate improvement. Two months later the improvement still continued, and the condition could in no way be compared with what it had formerly been. There was, however, a sensation of weight in the anus and rectum. The posterior vaginal wall flabby and full. It is clear that the vagina has not its normal calibre. It will become necessary to operate upon the rectocele should the tissues not regain their tone.

The following cases, on the contrary, prove the efficacy of the intervention when this is as complete as it is called for by all the lesions. The first one is not, however, a very good example. I simply cite it to complete the list, and because the final result was good.

Case VIII.—Pahour. Retroversion; prolapsus; cystocele; Alexander's operation and anterior colporrhaphy; immediate failure through operative accident. Tardy, good result.

Case IX.—Ratiner. Endometritis; cystocele; retroversion; scraping; anterior colporrhaphy; shortening of both round ligaments. Excellent result.

Case X.—Mouranchon. Endometritis; retroversion; cystocele; rectocele; former total rupture of the perinæum; uterine prolapsus; curative treatment; anterior colporrhaphy; posterior colpoperinæorrhaphy; double shortening. Complete and permanent recovery.

Case XI.—Dumontaux. Endometritis; retroversion; cystocele; scraping; anterior colporrhaphy; double shortening. Complete and permanent success.

Case XII.—Vial. Same symptoms, together with complete relaxation of the vagina, which had been treated by all of the plastic procedures.

D.—RETROVERSION, COMPLICATED WITH LACERATION OF THE CERVIX; WITH OR WITHOUT FLEXION AND PROLAPSUS.

I shall merely call to mind that the shortening of the round ligaments would have no effect upon a womb fissured by a long cicatrix. On the other hand, it goes without saying that the metritis would remain incurable if the shape is not restored at the same time that the cervix is restored, and the morbid tissues excised.

Case XIII.—Magadieu, age 22. Unipara. Deep bilateral laceration of the cervix; actual retroversion and apparent retroflexion, due principally to the marked eversion of the posterior lip of the cervix; fungous erosion; treatment and scraping; Schroeder's operation; shortening of both round ligaments. Complete success in every operative procedure adopted.

Case XIV.—Reynard. Multipara. Same symptoms as in the preceding case, with the addition of an actual flexion and of prolapsus; uterus kept up during several years by a ring-pessary; perineal laceration; cystocele and rectocele.

Treatment.—Uterine manipulation by successive dilatations; scraping; Emmet's operation; anterior colporrhaphy and posterior colpoperinæorrhaphy; double shortening. The patient was operated upon one month before my departure. The mechanical results were perfect. There existed a nucleus of posterior parametritis, no doubt developed at the midst of stretching of the adhesion, but this in no way interfered with the success of the operative plan.

Case XV.—Briatte. Same symptoms. Confirmed success.

Case XVI.—Rème. Same symptoms. Same success.

E.—UTERINE PROLAPSUS, WITHOUT APPRECIABLE DEVIATION OF THE AXIS; RELAXATION OF THE VAGINA, WITH DIVERS COMPLICATIONS.

Case XVII.—Nouviaire. Prolapsus; cystocele. Anterior colporrhaphy and Alexander's operation. This patient became pregnant, and was successfully delivered. Two years after the operation, and a short time after confinement, the state of the genital organs was normal.

Case XVIII.—St. Arnaud. Endometritis, prolapsus, cystocele, rectocele.

Treatment.—Scraping, anterior colporrhaphy, posterior colpoperinæorrhaphy, shortening. Successful.

Case XIX.—Doillette. Same symptoms. Same procedure. Same good result.

Now follows a case in which I performed the treatment in two operative series at about one year's interval. The second procedure was necessitated through the insufficiency of the first.

Case XX.—Gérard. Prolapsus, cystocele, rectocele. Lacerated and hypertrophied cervix.

Treatment.—Amputation of cervix. Posterior colpoperinæorrhaphy. Relief during one year; but persistence of a cystocele, which tends to aggravation. Thereupon, performance of anterior colporrhaphy and shortening. Success.

F.—PROLAPSUS, WITH MAINTENANCE OR EXAGGERATION OF THE NORMAL ANTEVERSION.

Is the operation of shortening necessary in this case? If I advocate it for the preceding cases, where there is a marked backward deviation, or a tendency toward displacement in the same direction, it is because I have proofs that in these cases the round ligaments are weakened and relaxed. They no longer perform their duty.

But it has appeared to me in many cases of my own, in which I have often performed the plastic operations, when the uterus had completely descended, but in a good position,—that is to say, in a position of anteversion,—that the round ligaments performed their functions

properly, and that, once the plastic operation performed, the uterus in position was completely normal. In fact, from the moment that the uterus remains in connection with the bladder, the indications are that the round ligaments are neither relaxed nor enfeebled, and are possessed of their due tonicity. We may conclude, and the proofs are numerous, that once the pelvic floor is restored, and the anterior vaginal wall consolidated and the cure of the cystocele obtained by a good plastic operation, everything will have been replaced in the pelvic equilibrium. The bladder, raised by the diminution of the vaginal wall, will rise in the pelvic basin and take its normal position. It will naturally draw with it the uterus, and will raise it, and the latter will be found in its ordinary state. It will retain its normal flexion, and its anteversion will be diminished in the same proportion, for it may be generally considered that when there exists prolapsus, with relaxation of the vaginal walls, exaggerated anteversion is the rule. *The cystocele, in other terms, necessarily brings with it the anteversion.* Therefore, much benefit will be derived when the womb is somewhat raised.

In the following case, I have uselessly performed the shortening, for the position of the uterus varied but little before and after the operation, as was shown by the careful examinations.

I have yet to show cases in which the cystocele has reached an extreme stage.

Case XXI.—Laureille. Prolapsus, cystocele, rectocele, anteversion.

Treatment—Plastic operation combined with shortening. Recovery.

RESULTS.

In reviewing these twenty-one cases, I have *two* which are incomplete, because the series of operative combinations was insufficient (Cases V and VI). It will be necessary to complete it in the future:—A case of initial failure with tardy, good results. An operation, with a useless shortening as the only noteworthy accident, of no importance, however, and a passing parametritis.

Those portions restored to their reciprocal normal relation with each other have continued to retain the position in which I have replaced them through the combined operations. Truly, I have the right to consider these results excellent, even counting the two partial failures.

OBJECTIONS; DURATION OF COMBINED OPERATIONS; OPERATIVE DIFFICULTIES; NEW TECHNIQUE FOR PLASTIC OPERATIONS.

Objections have been made (*a*) to the difficulty of finding the round ligaments, (*b*) the possibility of breaking them, (*c*) their absence, (*d*) the insufficiency of their retentive action, (*e*) the complications of

the wound and the danger of peritonitis as a result of opening of Nuck's canal, (*f*) the violent pains to which the patient is subjected after the operation, (*g*) the insufficiency of the operation as regards the prolapsus and the surrounding parts, etc.

I have not the time to answer all these objections; I have already done so. They have no important value. I was almost an opponent of the procedure of shortening, in my first studies, as to its value. Practice and experience have modified my ideas. Nearly all surgeons have followed the same path. Hesitating, at the beginning, they have ended by recognizing the exaggeration of their first objections.

Therefore, for my part, I say there is neither serious difficulty of execution, nor are there any grave results following the operation. Antiseptic precautions insure operative success. A good diagnosis and a good operative plan will insure therapeutic success.

There may be some doubt expressed as to the actual length of the combined operation. Those who have been able to witness my mode of proceeding are convinced that this objection is of no value. I am happy to say that I have had occasion to perform four series of operations at a single clinic, before a number of American physicians, viz.: Drs. Ludlam, Jr., and Waite, of Chicago; Drs. Shepard, of New York; and Grondin, of Quebec.

Finally, one of the vice-presidents of the American Gynæcological Society, Dr. Reeves, of Dayton, Ohio, has seen me in Paris perform one of my most complicated operations at one *séance*. He was able to assure himself, by the examination of some of my operated patients, of the permanence of the results, after several months.

The average time necessary for the longest series is one hour and a quarter. This time may be a little extended or lessened, but this is of no moment, as the most important requirement is not to have to return to the same work several times. Very few women would consent to submit to two or three operative *séances*, separated by intervals of weeks. Practitioners will certainly appreciate the advantages offered by the realization of the entire operative plan in a combined series, practicable at one time.

The rapidity of execution depends principally upon the selection of methods.

1st. For plastic operations upon the vagina, I have replaced the dissection with the bistoury by the detachment of the mucous membrane by means of the fingers. I make a transverse opening like a buttonhole, with a knife, at the extreme end of the surface to be denuded. I loosen lightly the edges of this incision; I first introduce one index finger, then the two indices, into this pocket-like space, and I loosen toward the vulva. I also make a sort of pocket, which I can widen or enlarge as much as I please. The loss of blood is much less,

and the loosening is very even and very rapid. I have now only to divide the mucous membrane by two cuts with the scissors, one on each side.

The suture is first made with several deep, continuous stitches with catgut, and then by superficial stitches with silk.

2d. For the shortening I also make but little use of the bistoury and force the tractions, without forceps, solely with the fingers, with the aid only of a grooved director. The hemorrhage is thus insignificant. The division of the nerves of the region is avoided. The fan-shaped portion of the ligament does not become detached, and detection of the solid and rounded portion is certain.

The operation is more easy of execution upon the living subject than upon the cadaver. When the ligament is small at its origin, it is always large and solid at its peritoneal end, where the suture is made. I have several times opened the peritoneum and introduced the index finger up to the annexes in order to loosen them by traction on the adhesions. I have never had any accidents resulting from this.

The suture of the ligaments to the pillars is double, and is made with strong silk. The cutaneous sutures are made with *crin de Florence.* I do not now make use of any drainage, and completely close the wound. At first I did use drainage.

I never introduce any intrauterine or vaginal pessary.

The vaginal pessary is advantageously replaced by a solid tampon of iodoform gauze.

As regards the stem-pessary, this becomes unnecessary, as where there is flexion existing. I never operate before practicing the necessary dilatation of the womb in such a manner as to overcome the resistance of its tissues.

It is therefore seized in an upright position, and sustained at the very time when the flexion is momentarily overcome and the morbid tissue softened. The operative procedure in itself does the rest, and effects the cure of the flexion without necessitating the use of an intrauterine pessary. It is only natural to suppose that my later operations have been most surely and rapidly followed by primary cicatrices.

I have, moreover, only observed sero-purulent discharges in five cases, and then only on the one side. These cases recovered rapidly. I had a single case in which there was suppuration prolonged for a little over a week, and promptly coming to a fortunate termination, notwithstanding the coexistence of parametritis. Since I have abandoned the drainage of the wound, and since I have been in the habit of lightly irrigating the wound with a solution of bichloride of mercury, I have not observed any pus.

The shortness of the operation and its easy execution require, over and above all, besides the aforesaid consideration, the necessity of conforming to the rational and logical succession of the serum

operative procedure. The natural order of procedure is to perform as the case may require in the following order :—

1st. Scraping.
2d. Restoration of the cervix.
3d. Anterior colporrhaphy.
4th. Posterior colpoperinæorrhaphy.
5th. Shortening of the round ligaments.

This order of succession becomes necessary, so that one procedure of the general operation shall not hinder or prevent the one following it. In four cases I shortened only one ligament, with entire success in three cases, and with only partial success in one case, where the uterus was very much hypertrophied and lengthened. (Vezin, Case V.)

This short article may, however, I hope, serve to convince my readers, by the facts shown and by the reasoning, who is in the right. I am convinced, through my own practice, of the value of the shortening of the round ligaments, modified and combined in various ways, with the restoration of deviations of the womb, within the limits already indicated. I hope that this article may win for the operative new adherents, who, like myself, will make their own experiments, and not depend upon the opinions of others.

OPERATIVE DENTISTRY.*

By C. N. PEIRCE, D.D.S.,

AND

EDWARD C. KIRK, D.D.S.,
Philadelphia.

MECHANICAL SEPARATION OF TEETH FOR EXAMINATION AND TREATMENT OF APPROXIMAL SURFACES, RUBBER-DAM APPLIANCES, ETC.

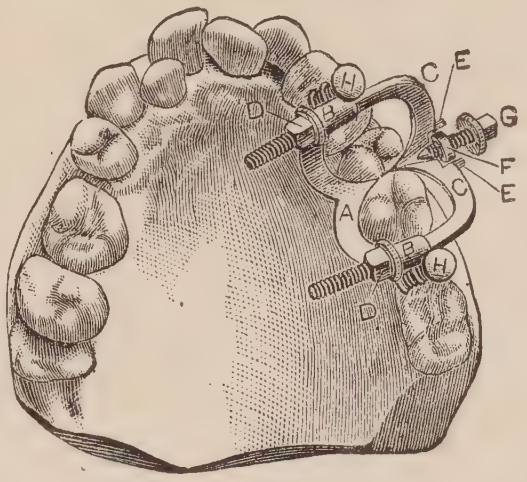
For the better examination of approximal surfaces some means for their ready separation which shall accomplish the purposes with the least distress to the patient and in the most rapid manner is a desideratum. The various means heretofore employed, such as the introduction of rubber, cotton, tape and wedges of wood have each been open to objection; particularly and common to all of these is the length of time required to obtain the necessary space. To obviate this, mechanical devices, operated upon the combined wedge-and-screw principle, have been devised.

Those of Dr. S. G. Perry perfectly fulfill their purpose, and enable the operator to gain all the space necessary for examination or for operation, and in a few moments. Perry's instruments include several

* This article, through unavoidable circumstances, could not be gotten ready in time for the first series of the ANNUAL, as announced in the Preface.

in a set, adapted each to a particular class of tooth. To overcome the objection which the need for several of these instruments involves, Dr. H. A. Parr, of New York, has devised an instrument of this class which is universal in its application. The inventor claims that it is equally adapted to long or short teeth, and is intended to meet all cases, particularly irregular teeth. The mechanism of the appliance will be readily understood by reference to the figure. In adjusting the separator, the screw (G) is removed and the instrument placed upon the teeth, with the points projecting upon the teeth to be separated. Turning the nuts (C) will usually give sufficient space. If more power is needed, the screw (G) is to be tightened.

The use of mechanical separators is attended with less discomfort and distress to the patient than any other means for obtaining space. Inflammation of the gum-tissues and pericemental membrane is entirely avoided, the tooth operated upon is subjected to less jar during the filling operation, and there is good reason to believe that sensitiveness of the dentine is greatly lessened by the benumbing effect of the tension to which the nerve, entering the root at its apex, is subjected.



Besides affording space sufficient in a few moments for any ordinary contour operation, the mechanical separator acts as a clamp, which holds the tooth rigidly in position and at the same time holds the rubber dam well out of the way of the operator, and ordinarily does not in any degree obstruct the light or access to the cavity. In case the separator should be in the way, a hickory or orange-wood wedge can be inserted in the space made by the separator, which is then to be removed.

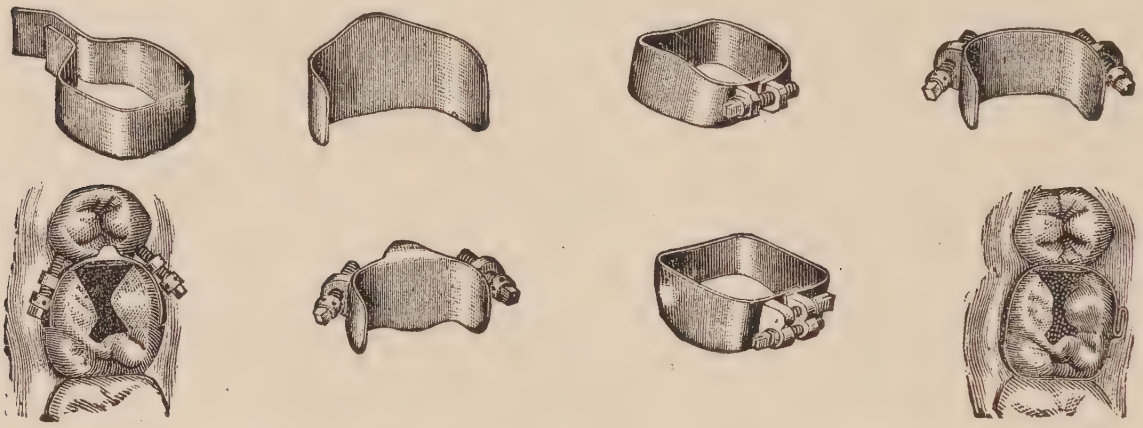
The appliance is an invaluable aid to the busy operator because of the amount of time it saves, as approximal surfaces may be rapidly examined and filled at a single sitting, which would otherwise require a number of visits, involving considerable time, not to speak of the discomfort to the patient.

In demonstrating the use of his universal separator at the clinic of the International Congress, at Washington, Dr. Parr operated upon a number of patients, and in every case obtained sufficient space in a few moments for examination and operation.

Dr. A. W. Harlan, before the Illinois State Dental Society (*Cincinnati Medical and Dental Journal*), advised care and judgment in the application of the mechanical separator to young teeth in which

the apices of the roots are incompletely formed, owing to the danger to the pulp from the rapid wedging.

In performance of operations, particularly the preparation of cavities in the lower teeth, in mouths where the flow of saliva is copious, and where the application of the rubber dam is difficult, Dr. David Genese (*Maryland Medical Journal*), of Baltimore, uses an instrument devised by him, which he calls the Syphon Tongue-Holder. It is made of German silver, nickel plated and highly finished, with three sizes of depressors, which will be all that are required. It is easily kept clean, and is rapidly handled. It can be worked with a ball-syringe, but a flow of water is preferred. It will syphon a pint per minute if desired, and by the arrangement of the inlets no undue pressure is felt on the soft tissues or the tongue during the operation. Its capacity has been tested in many cases, in one of which the patient retained it in the mouth from the commencement to finish of three large crown fillings, taking two hours, during which time the head was not removed from the head-rest of the chair. The brightly polished surfaces of the instrument acts as a reflector.



In the application of the rubber dam, Dr. W. N. Morrison (*The Ohio Journal of Dental Science*) recommends the use of rubber ligatures, cut in strips from the ordinary rubber dam and carried between the teeth in the same manner as floss-silk, and when in position the ends are clipped to get them out of the way. He finds it just as effectual as silk, and not so liable to cut the dam; especially where the cusps are sharp, and in places where it is difficult to get the dam through.

Dr. Harlan advises, under similar conditions, thorough cleansing of the mouth and coating the dam with soap at the points of perforation, after which it may be easily carried to its place by waxed silk.

Dr. Herbst (*Independent Practitioner*), instead of using a clamp for holding the rubber dam in position, cuts the point from a common pin, flattens it with a little hammer, and curves it to make it partially conform to the shape of a tooth, and inserts it in the interdental space next the tooth to be filled. The rubber dam is then "hitched" over it, and thus held until the ligatures can be adjusted. He thus reduces the discomfort to the minimum point.

Proper adjustment of the rubber dam to perfectly exclude moisture is a matter of the utmost importance. In practical operations, a suitably adapted clamp is a desideratum not always readily obtainable from the instrument makers. Dr. Corydon Palmer gives the following directions for making or altering clamps to suit special cases; the flat bowed are generally the most applicable, and can be sufficiently altered by taking the temper out by heat, then altering the curves to suit the case properly, and retempering. To do the latter he carefully heats the clamp to a low, red heat and drops it into cold water, which hardens it. The surface is then smeared with olive oil, and the clamp held over a spirit-lamp until the oil burns off. It will then have the proper temper. There is a disadvantage in having the clamp too stiff, as it is painful to the patient by reason of the excessive pressure which it exerts on the tooth. A properly tempered and adjusted clamp should cause no discomfort to the patient.

The subject of the matrix has occupied a large share of attention during the past year, and a number of devices have been brought forward for simplifying what otherwise are laborious operations upon the approximal surfaces. To meet all requirements the perfect matrix must be simple in construction, easily adapted, not too stiff, so that when in use it will yield just enough to allow sufficient gold to pass beyond the walls of the cavity to make perfect margins when the filling is finished. Among the more recent devices for this purpose are the double-screw matrices of Dr. William A. Woodward. His matrix is formed of a strip of flexible metal of variable thickness and width. Two posts are soldered to this strip, and through each post a screw passes. These screws impinge upon the contiguous teeth, forcing the matrix against and around the approximal teeth. It is quickly adjusted and the parts do not become detached and are not lost or dropped upon the floor in adjusting. It has the advantage of occupying but one interdental space. The flexibility of the matrix secures adaptability and gives it a large range of usefulness. The screws retain it positively and allow of all necessary adjustment as to pressure upon the teeth. When not too tightly adjusted it moves away from the tooth as the filling progresses. Overlapping of the margins can be controlled by loosening the tension of the screws. As the masticating surface is approached, pressure can be reapplied, separating the teeth at their necks and leaving only the thickness of the matrix from the part of the filling to be in contact. They are well adapted to the class of cavities where the matrix has proved most useful. For the introduction of gold fillings the thickness of the matrix should be number 30 standard gauge, for plastics it should be much thinner.

For the introduction of plastics, particularly amalgam, with the matrix those of the Guilford type possess decided advantages over

those with enlarged ends, as their removal in this class of operations is readily affected by withdrawing the band laterally, by which means the filling is not disturbed or the edges broken, which frequently happens in the case of amalgam fillings when the matrix is withdrawn downward.

Dr. S. G. Perry, at a meeting of the New York Odontological Society (*Cosmos*) thus describes a set of matrices made by Ash & Sons, of London, and known as the Ladmore-Brunton set, which were sent to him from Paris by Dr. Bogue: "My first impression was that they were of little value, and I questioned whether we had not already in this country several that were superior to them. However, after some trial of the matrices, I came to like them better, and find that the more I use them the better I like them. The matrix is simply a little band of steel with holes in the end, and so shaped as to pass between the teeth and be caught by little fingers which engage in the holes and are controlled by an adjusting screw. With it comes a very neat watch-key wrench, the flexibility of which makes it easy to use in almost any position. One of the principal advantages is that the

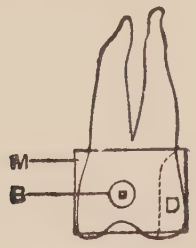


Fig. 1.

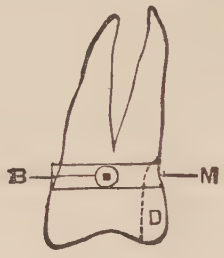


Fig. 2.

matrix adjusts itself to the narrow necks of the teeth. It will turn in or out just as the tooth may be shaped, so that an adjustment to the tooth can be obtained that is a little closer than is practicable with any other matrix I have seen. One of the disadvantages is that it goes entirely around the tooth, and takes up a little space on both approximal sides of the tooth; but it is made very thin, so that that objection is not very great after all. It is so thin that you can pass it between any two teeth where floss-silk will go. Still, in the restoration of contours I do not like the idea of the matrix going entirely around the tooth; I think if it went only half way around it would be better. Another objection is that it is made up of two parts, of which one is so springy that it slips out of your hand and flies anywhere in a provoking way. At the same time, I do not find any matrix more satisfactory for a large class of cases. If it is desirable to bulge the filling at any point, it can be done by loosening the screw a trifle and using the mallet with a little more force than usual."

Dr. Theodore F. Chapein, in an article upon "The Use of the Matrix" (*Cosmos*) makes the following observations upon the difficulties in the way of the more general employment of the matrix as

an adjunct in filling approximal cavities. He says, "It has occurred to me that the difficulty with most matrices put upon the market lies in their width, and that their efficacy may be increased and the drawbacks which we have alluded to overcome in making them narrower. To make my meaning clearer, I have sketched (p. 246) two molar teeth with matrices applied. One (Fig. 1) is the ordinary width of the Brophy matrix, M representing in each cut the matrix, B the bolt, and D the decay. In Fig. 2, a narrow matrix of the Brophy style is applied. It will be seen in Fig. 1 the edge of the matrix stands away from the cervical wall of the decay, while in the narrow matrix of Fig. 2 it lies close to this wall. However tightly the bolt is screwed, this will not cause the wide matrix to lie any closer to the tooth, for the pressure will be at the most prominent parts. The advantages likewise gained in a narrow matrix are that the parts can be clearly seen and well filled at the most vulnerable part,—the cervical margin.

"Of the other band-matrices, Dr. Guilford's has the advantage that when the work is finished and the clamp unbolted the band may be slipped off with ease between the adjoining tooth and the filling just inserted.

"A difficulty with the Guilford clamp is that it is extremely difficult to insert the small pin, as well as the screw bolt of the clamp, in the holes of the band. The Ladmore-Brunton device for the same object as the device of Dr. Guilford, *i.e.*, for clamping band-matrices to teeth, offers much less difficulty in the application, and this, with its flexible-handled key, is a splendid arrangement. All, however, are open to the same objection, viz., the width of the band; but this may be rectified, I think, by the use of a narrow band.

"While on this subject, and as pertinent to it, I will mention a suggestion made by Dr. E. R. Pettit at a meeting of the Pennsylvania Association of Dental Surgeons. He remarked that in punching the holes in the bands (he made a band for each case) he did not punch them in the middle of the ends of the bands, but on the lower edges, the two methods being shown in cuts.

"The advantage he claimed in this was, that the pressure was exerted at this lower edge and caused the band to flare, so that the lower edge could be made to approximate to the cervical wall, while the upper edge assisted in forming the contour."

In the course of some remarks before the Illinois State Dental Society, Dr. T. W. Brophy states that, while matrices are invaluable in many cases, he believes their indiscriminate use is wrong; "but so is the indiscriminate use of almost any instrument." He urges the use of soft gold, or, better still, tin and gold at the cervical margin for the first third of cavities. In inserting these materials with a matrix he uses no retaining points and no grooves at the cervical margin. He leaves the floor of the cavity smooth and generally sloping from the

gum to the interior. His undercuts are made in the lateral walls, but sufficiently far from the top to prevent danger to the masticating surfaces. He condemns the use of a piece of broken separating file as a matrix, the objections being that it gives a flat, unyielding surface which will not conform to the tooth, and fillings made by its use are invariably flat and without contour, and the cervical margin is always a point of uncertainty. Dr. Black, at the same meeting, called attention to the difficulty in the successful use of the matrix when the bottom of the cavity is bowl-shaped. The gold in such cases will roll up or turn to one side, and the filling will be insecure from the start.

Dr. Allport, while condemning the general use of matrices, referred to the value of their occasional employment. He said: "I do not believe a good operation can be made with a band-matrix when the cutting edge is larger than the neck of the tooth."

For the finishing of fillings at the cervical margin, Dr. Noyes (*Cinn. Med. and Dent. Jour.*), before the Illinois State Dental Society, advocated the use of sand-paper disks or disks made of emery-cloth, which he coats with oil. He finds that they cut faster and with less pain to the patient, as less heat is generated by the operation. In addition to this they are pliable and can be directed with a properly shaped instrument into depressions and irregularities of surfaces that no other disk would reach.

Dr. Brophy at the same meeting stated that when tin and gold, or tin alone, was used at the cervical margins he found no occasion to use at that point either disks or strips in finishing, as all the polishing necessary can be done with a burnisher in such cases. Where he found it necessary or desirable to use anything more, he used Dr. Parmly Brown's strips charged with corundum mixed with glycerine to a paste the consistency of honey. These he found superior to all other means.

For those who use sand-paper disks and desire to make their own readily, the following method, contributed by F. L. D. to the *Archives of Dentistry*, will be found serviceable. He takes a No. 10 ($\frac{3}{4}$-inch) gun-wad punch and drills a hole up into the centre of the shank. In this hole is driven a steel pin, the free extremity sharpened and on a level with the cutting edge of the punch. From a sheet of sand- or emery-paper, shellacked on the back, can be punched with this instrument dozens of disks, perforated in the centre ready for mounting.

FOR THE FINISHING OF AMALGAM FILLINGS.

In many places a narrow strip of rubber dam, used as a tape, will serve admirably for the purpose of smoothing down to the borders and polishing amalgam fillings on proximal surfaces of the bicuspids and molars, and is especially good for removing any particles that may adhere to the gum between the teeth.—*Ohio Jour. Dental Science.*

DENTAL OBTUNDENTS.

For the preparation of Dr. Herbst's obtundent, Dr. Bodecker gives the following directions: A small quantity of chemically pure sulphuric acid is saturated with the hydrochlorate of cocaine, stirring with a glass rod until perfectly dissolved. When the acid will dissolve no more cocaine, add sulphuric ether until supersaturated, still stirring with the glass rod. It must not be shaken in the glass bottle, as the violence of the combination may cause an explosion which is liable to break it and force the cork out, throwing the acid in the eyes. It is best prepared in a long test-tube. If any ether remains it will evaporate by standing. It is then ready for use. A little is to be taken on cotton and applied to the sensitive dentine. It obtunds only to a slight depth, and then another application must be made. Its action is prompt and thorough. It is not necessary to weigh or measure either the cocaine or the sulphuric acid, as it will not take up any more than enough.

Professor Taft (*Proc. Am. Dental Assoc'n*), at the last meeting of the American Dental Association, says, with regard to this preparation, that, " for his own satisfaction he had determined the amount of acid and cocaine necessary. He found that one drachm of sulphuric acid dissolved thirty grains of cocaine crystals. The amount of ether was easily arrived at, as all in excess of the amount necessary for the saturation quickly evaporated. He had used it daily for three months, and in every instance had been successful. Its action was very simple as far as the process was concerned; the sulphuric acid dissolves a layer of dentine, acting as a caustic on the living tissues; the cocaine obtunds the pain of its action, the ether serving the same purpose. It should be applied after drying the cavity before operating If the cavity is well formed there will be no objection to leaving in the bottom the powder which will be formed by the dissolved dentine, which is sulphate of lime. The acid is satisfied with what it has dissolved, and its action can not go beyond that point.

Dr. Taft said that in indorsing the obtunder he spoke only of his own experience with it. He also stated that Herbst had used it for five years with the best results, so far no unfavorable results being detected.

At the same meeting Dr. Rehwinkel recommended the following preparation for obtunding the sensitiveness of dentine: Half a grain of veratria to three drops of absolute alcohol, to which is added tannin to saturation; then add ten drops of glycerine. Apply after the dam is in place and the tooth dry. It is exceedingly poisonous.

Professor Truman said that an escharotic could not be placed in contact with dentine without disturbing the main body of the pulp. Dr. Herbst had a very different character of tooth-structure to deal with,—teeth of a very dense character,—while here teeth were of soft structure, and such agents could not be used with safety.

Dr. Bodecker said he must correct that inference. Dr. Herbst had shown him teeth of very poor structure (children of ten and twelve years of age, for whom he would under no circumstances have used gold) which he had treated with this escharotic. They were found in perfect condition, the edges absolutely perfect, resisting every test. In one case the pulp had been exposed but had survived, as was proved by the ice-water test. He hoped next year to show the effects in four of his own teeth in which the obtunder had been used.

Dr. Morgan says there is no risk in using an agent when we know its limits. If we know it to be self-limiting it is perfectly safe.

Dr. Sitherwood said that, as he understood it, the principal agent, sulphuric acid, was known to be self-limiting, and therefore would do no harm.

Dr. Taft repeated the formula, and again explained the formation of sulphate of lime in the cavity, an insoluble powder, beyond which the acid cannot act. It is satisfied with what it has dissolved.

Dr. Atkinson said that was where it differed from chloride of zinc or arsenic. You never know when their action will cease; it may go on for months. Chloride of zinc acts as an obtundent by changing the pulp into hypochloride of albumen as clear as glass.

With regard to the solvent quality of the Herbst obtundent Dr. E. A. Bogue exhibited, at a meeting of the New York Odontological Society (*Cosmos*), a bottle which contained Herbst's obtundent, and into which, a month previously, he had placed a tooth, during which time it had been completely dissolved. It would seem that in the use of this agent in cavities of deep decay great danger of making a profound escharotic impression upon the pulp-tissue may arise, although, when proper care is taken as to the quantity used, the method of its application, the time it is allowed to remain in the cavity, and due consideration used with regard to the proximity of the pulp, it need not necessarily be attended with any disastrous results.

The editor of the *Ohio Journal* gives the following obtundent preparation: Squibb's ext. of cannabis indica on a pellet of cotton tape is dipped into Robinson's Remedy, and then into a solution of cocaine, and the mixture applied for several minutes to the sensitive dentine.

Dr. Harlan recommends "ten grains of the alkaloid (crystals) of cocaine and ninety minims of sulphuric ether," claiming that it makes a perfect solution and will act with more certainty than the Herbst obtundent, and is not self-limiting.

At the meeting of the Mississippi Valley Association (*Ohio Jour. Dental Science*) Dr. J. S. Cassidy recommends the following preparation as a dental obtundent, which has proved uniformly successful in his hands: camphor, one drachm; chloral, one drachm; cocaine alkaloid, half an ounce; and sulphuric ether, two drachms.

For the successful exhibition of remedies for the relief of sensitive dentine, absolute dryness of the cavity is essential in order to obtain the best results. The dam should always be applied and the cavity thoroughly dried with absorbents and afterward with hot air. The thorough desiccation of the dentine by means of hot air, of itself greatly lessens the sensitiveness of that tissue. To accomplish this the ordinary hot-air syringe may be used, but its action is somewhat slow and tedious. Compressed air, warmed by passing through a heated jet, probably first introduced by Dr. Bing, of Paris, and more recently brought to the attention of the profession by Dr. Register, of Philadelphia, furnishes at once a means most rapid and thorough for obtaining absolute dryness in cavities, so that the pain attending upon their preparation is materially lessened. The application of an obtundent, where the cavity has been thoroughly dried by this means, reduces the sensitiveness to a minimum; it requires about five minutes to render the dentine of a tooth nearly painless with the Register apparatus, and beside the use designated it is of great value in the operation of grafting crowns, where it is desirable to get the root dry. Dr. Register utilizes the hot-air current with minute jets for carrying medicaments beyond the apices of roots, and in the treatment of the pockets around the necks of teeth affected with pyorrhœa alveolaris.

The following article upon "The Selection of Filling Materials" was contributed by A. Morsman, Omaha, Neb.:—

It goes without saying that in the mechano-surgery of dental caries good judgment in the selection of materials is prerequisite to success. This judgment must be based upon (1) knowledge of the *needs* of the cavity to be operated upon and the conditions pertaining to the patient, the tooth, and the locality of the lesion, and upon (2) accurate knowledge of the nature of the materials from which the choice is made, what they will do and what can be done with them; their possibilities, their defects, and their virtues. If they are simple materials, we learn them as elements. If complex, we must know their components, their action as elements, their action upon each other, and their action as compounds. The use of any material, the composing elements of which are unknown, is empiricism purely. An operator can form no just estimate of the value of any material the parts of which are represented by X, Y, Z.

It is very true that an observant operator can, by long use of Boggs' amalgam or Moggs' cement, learn what is to be expected of them, provided they remain the same. But this empirical knowledge is not sufficient, because they may *not* remain the same, and also because their use does not confer any knowledge of what might be accomplished by changing the construction of these compounds. The mechanic may learn what solder is for and to make good joints, but

only the mechanic who knows what solder is *made of* may be expected to improve upon it and to use it intelligently. The physician who uses known remedies or their compounds gains a valuable experience, but the use of "vinegar bitters" and "cholagogue" would leave him as ignorant as when he began.

We say that dental students go out to "practice," and scarcely think of the meaning of the word. It means just what it says—to try; and by trying to learn. *Intelligent trying* and observing results will make the skillful operator; the reverse, the empiric.

The selection of a filling material is to be governed by many considerations and conditions, and it is these I purpose reviewing in this article. Not to presumptuously put my judgment against that of other operators, but to seek for a basis for intelligent reasoning.

The conditions under which we work have a very important bearing upon our judgment. They may be divided into conditions pertaining to the patient, to the mouth, to the teeth, to the locality, to the cavity, and to idiosyncrasies.

Our patients are not all made after the same model. The systemic condition of one may forbid a protracted operation; the extreme sensitiveness of another compel a mild one; the self-indulgence of a third demands something easy; and the empty purse of the fourth something cheap.

The mouth is our laboratory and work-bench. It may be a good one or not. No one should undertake impossibilities; and a little experience with small mouths, deformed mouths, and flooded mouths is convincing that impossibilities exist.

A great deal has been said about the structure of the teeth in connection with filling materials. "Too soft for gold" is a common phrase, and "in proportion as a tooth needs saving gold is the worst material to use" a celebrated one. Both imply that defective structure determines the selection of material. This dogma of the "new departure" has come to be pretty generally accepted, I am afraid, like a good many other things,—"on trust." Tooth-structure seems to be pretty largely a matter of age, temperament, and heredity. That we have any material that will improve the *structure* of a tooth, as has been claimed, is a matter open to doubt; and that structurally defective teeth are unfit for gold is a proposition that has not been demonstrated to *my* satisfaction. But it is a matter to be duly considered, and the facts shown by experience taken as evidence. Right here, however, is a point,—we must be careful to get at *facts*. It is so very easy to be deceived in examining evidence of this character. It is granted at once that failures of all fillings are more likely to occur in this class of teeth than in better ones, but there are numerous reasons why this is so. Vitiated saliva, uncleanliness, imperfect work in pre-

paring the cavity or inserting the filling, too much malleting, and many others testify to the truth of this statement. Imperfect work includes a multitude of causes for failure; for when we consider the many things to be done in preparing a cavity,—its proper shaping, the requisite firmness of margins, evenly balanced judgment, when to cut and when to conserve, the accurate adaptation of materials to the walls of the cavity, and the preservation throughout the entire operation of perfection in minute details,—it is no discredit to say that the most skillful may do imperfect work.

This goes to show the negative value of evidence seeming to support the proposition that failure is due to material, while on the other hand every case of teeth that are structurally defective, and that have been saved by gold, is *positive* evidence to the contrary. And who has not seen hundreds of them? If I read my own experience right, there is no material that will compete with gold in this class of cases except the cements, and they only on condition that they are frequently removed. Of course, some one will cry "gutta-percha!" but gutta-percha is very limited in its application, as I will show when I take it up. The claim that amalgam is "better for soft teeth than gold," or is "more compatible with dentos," I believe to be without foundation.

I have already alluded to the belief that certain materials—notably copper amalgams and the cements—have the power to change the structure of a tooth in which they are used as a filling for a carious cavity. If there is any truth in this theory the area acted upon must certainly be *very* limited. And as it is not at all likely that the enamel could be changed by it, the effect, if produced, could have no conservative value as a barrier against post-operative decay. But I do not consider the evidence as very convincing. It is argued that if an extremely sensitive cavity be filled with one of the cements, at the end of a few weeks it can be excavated without much pain, which I admit; but the argument goes on, *therefore*, "owing to the stimulant effect of these materials a deposit of secondary dentine is produced," etc. This I do not admit. Both of the cements are entirely capable of destroying the fibrils for a short distance from the surface upon which they are placed. Indeed, it has been claimed that they have the power to destroy even the entire pulp. This action is sufficient to account for decrease in sensitiveness, and I have never seen any other evidence of secondary dentine under cement fillings.

In regard to copper, it is stated that by reason of its being a constituent of an amalgam, a dark-colored deposit is formed between the surfaces of the fillings and the walls of the cavity that has a beneficial effect upon the tooth. I am not prepared to deny the beneficial effect of this deposit; in fact, I am inclined to the belief

that it has a beneficial effect, *mechanically*, upon the filling; but I deny that it is due to copper, on the evidence that I have seen the same conditions under amalgams which I knew contained no copper.

These considerations have not induced me to pay very much attention to structure in selecting materials.

Conditions pertaining to locality of the lesion merit the greatest consideration.

Cavities are easy or difficult, accessible or inaccessible, in sight or out of sight, as they are located, and the material should be adapted to the difficulties that are to be encountered. What would, by reason of obstacles, be badly done with gold, might be well done with amalgam. The abnormal position of an adjoining tooth may present an obstacle that necessarily decides what material shall be used. I do not pretend to say that all operators must be governed alike. All are not equipped alike. What is easy to the skillful is difficult to the bungler; but, in the main, all must be governed by the same general rules; the skillful man knowing the limits of his skill, and the unskillful one striving always for a higher standard.

The conditions presented by the cavity are of importance, also. A very large cavity might entail considerable time, endurance, and expense upon the patient that would be non-compensating. Walls may be gone that require contouring, or masticating surfaces that require rigidity. Depth of cavity may indicate non-conductive materials, and extreme sensitiveness or youth temporary work.

Idiosyncrasies are a law unto themselves. Each presents its special difficulties and may control the selection of materiais.

We pass now to the materials with which these varied requirements are to be met, and proceed to study their good qualities and their defects.

There is no known material that has so many qualities adapting it to this use and so few objectionable features as gold-foil. It represents really two materials, for it is used in two radically different conditions and by two different methods,—soft gold and cohesive gold. I use the term "soft" to indicate a gold which, prior to annealing, is non-cohesive, or nearly so, but which after annealing becomes cohesive. Perhaps better terms would be annealed and unannealed. I do not use any foil that will not become cohesive upon annealing, and cannot see any advantage in an absolutely non-cohesive gold. If a foil is soft without stickiness before annealing, it has all the advantages of strictly non-cohesive foil, with the added advantage of being easily made cohesive when desired. While the tendency to use soft gold is increasing, I think that the operators who make entire fillings of soft gold are not very numerous. Certainly I do not, but I almost constantly use the two in combination.

The qualities which especially commend gold-foil for filling teeth

are its adaptability to the walls of the cavity, thus insuring a tight filling, and its cohesion, hardness, and edge strength insuring durability. The skilled hand can do almost anything with gold-foil. In its soft condition the walls of a cavity can be perfectly overlaid with it, it can be built up solidly, and the edges burnished over the cavity-margins so as to be absolutely tight. Nor will these edges break under mastication, but are, on the contrary, only battered to place,—a very important property when we consider that a filling is nothing but a cork or stopper inserted into a hole, and that just in proportion as it is tight-fitting will it fulfill its mission. Other very desirable qualities of gold are its purity and incorruptibility. It always remains the same. The possibilities of gold are almost without limit. It can be built up and contoured to any desired shape, and lost tissue restored. Indeed, its limits are only set by the skill of the operator and the endurance of the patient,—limits which, however, it is rarely necessary to reach.

Gold has, of course, serious objections. It does not match the color of the tooth. Its conductivity is high, thus subjecting the tooth to undesirable thermal changes, and it is expensive. But by far the greatest objection to it are the time and skill required for its proper introduction.

Combinations of gold and platinum, gold and iridium, and gold and tin are used, but they partake largely of the nature of gold, and, as they have never attained any great popularity, it is unnecessary to discuss them here. Crystal gold is simply a cohesive gold in another form.

Tin is an old filling material, and is by many considered a very valuable one. It has about the same range of application as has strictly non-cohesive gold, with this disadvantage, that it does not wear as well. I have indicated my willingness to consign strictly non-cohesive gold to oblivion, and I would send tin along with it. I am aware that in taking this position I am laying myself open to the charge of being unorthodox, but I believe that reputation is already mine.

Possibly in the future I may be compelled to acknowledge my error, but at present I can see no mission for tin that can not be better filled by gold.

Amalgam, as a generic name, we will be compelled to qualify here in order to be more specific. Different alloys impart different qualities to the amalgam, so that they become almost different materials. After long study of these alloys and numerous experiments, which were published elsewhere, I have satisfied my own mind, although I may not have satisfied others, that there are really but two metals that have any decided value in dental alloys, namely, silver and tin. And I think I have demonstrated that *all* the desirable effects which can be produced by union of *any* metals can be produced by varying the quantitative composition of an alloy of these two metals. I am aware that this falls upon deaf and incredulous ears, and such will

continue to be the case as long as the profession allows itself to be led by the nose by nostrum vendors who publish formulas to suit the whims and traditions of the profession and make the alloy to suit themselves, or, as is more often the case, do not publish any formulas at all.

The properties which all amalgams have in common, and which make them desirable for filling materials, are numerous, the most important of which is their plasticity. They are exceedingly easy to manipulate, and work can be rapidly done. They have hardness and cohesion of particles. They are very easily put into very difficult places, and can be contoured to any desired shape. Obstacles that are insurmountable with gold have no existence as such when amalgam is used. Neither the presence of moisture, difficult location, nor size of cavity enter much into consideration in the use of this material. The objections to amalgam are serious. I think the most important one is its crystalline structure, which permits its easy fracture when the mass is small, as at cavity margins. Upon masticating surfaces, therefore, it is unreliable as compared to gold. This property of easy fracture makes it necessary to reverse the ordinary law of filling teeth, and cavity margins must support the material instead of being supported by it. We can overlay the margins of a cavity with gold, thus saving them from wear and accidents, but we cannot do so with amalgam, except the overlying mass be thick, and on masticating surfaces it is out of the question entirely.

The discoloration of amalgam is also a serious objection, and this can only be obviated by making the per cent. of silver in the alloy so very low that other desirable properties are lost.

There has been a great deal said about the shrinkage of amalgams, and the blame has been laid upon the alloy. I believe this is a mistake. I do not think any amalgam, when the per cent. of silver is not less than 40 nor greater than 70, will change to any dangerous extent, provided the amount of mercury used in the amalgam is not more than just the quantity demanded by the particular alloy used. The difficulty is that, in order to make amalgams sufficiently plastic and develop the very qualities that make them desirable materials, it is necessary to use somewhat more mercury than the alloy demands, and just in proportion to this excess will shrinkage occur.

Amalgam is a crystalline compound and subject to the laws of crystallography, but these do not always imply great change in bulk; and in this instance, although very slight change doubtless occurs, I think it is very slight indeed except under the conditions mentioned.

I would consider it entirely unnecessary to mention here the charge against amalgam of having a systemic effect, if it were not for the fact that the opinion still prevails in the minds of some physicians and, I regret to say, a few dentists. There has never been an iota of

evidence offered to sustain such a charge, and it is exceedingly difficult to account for the retention by such persons of an idea long since disproved except on the ground that the world moves slowly toward enlightenment. Still "it do move;" and they may be expected to fall into line in due time.

The conductivity of amalgam is nearly if not quite as great as gold.

I can not here enter into the discussion of the interesting subject of dental alloys, and will be compelled, therefore, to arbitrarily establish for the purposes of this paper a series of formulæ representing the different alloys that are to be used, these formulæ to be regarded as types which represent certain qualities. For convenience of mention and memory I will indicate them by number, which shall be the parts of silver by weight contained in 100 parts of alloy.

Amalgam No. 70 is an amalgam made from an alloy of silver 70 parts and tin 30 parts, united with mercury in the usual manner. It is an exceedingly hard amalgam, possessing excellent edge strength, and setting with great rapidity. It requires considerable rubbing in the mortar to make it amalgamate, and will bear more mercury than the average alloy. It is the best of all amalgams for cavities of easy access when upon masticating surfaces, for its edge strength is such that fracture of margins is reduced to a minimum. It sets too rapidly to be used for contour work, or for very large operations. It can be used for forming masticating surfaces when the body of the filling is of some other amalgam. Being quick setting, it is useful whenever this quality is desired. It discolors badly.

Amalgam No. 50 is from an alloy of silver and tin, equal parts. The edge strength is fair, and can be trusted everywhere except upon masticating surfaces, and here also under favorable conditions. It sets slowly, giving ample time for any operation. It amalgamates very readily. For all contour operations and difficult fillings requiring time it is most excellent. It discolors quite badly in some mouths, in others it holds its color reasonably well, but it is never to be used when color is important.

Amalgam No. 35 is from an alloy of silver thirty-five parts and tin sixty-five parts. It is very plastic and easy to amalgamate, and when used very dry makes a fairly tight filling. It retains its color reasonably well.

Its objectionable features are that it sets very slowly and has no edge strength. It can only be trusted when the edges are protected from mastication and other forces, as in simple approximal or buccal cavities. Its use is very limited in the hands of the gold worker. Still, I do not see any objection to using it in front teeth where the patient can *really not afford* gold. It is not to be compared with that metal, but it is much more durable than cement in ordinary mouths,

and its appearance is better than gutta-percha after the latter has lost its surface finish. While I would prefer to use gold at a reduced price than to use this amalgam in front teeth, still, if I could not meet the patient's purse, I should certainly use it. Many dentists work in communities where this consideration is all important, and it is time prejudice was laid aside by the gold workers and the material received upon its merits. As a substitute for gold it is *unqualifiedly* a failure, and there are none of the alloys of which this is the type, the so-called "white alloys," that are in any way an equivalent for gold, the manufacturers to the contrary notwithstanding; but as a substitute for cement or gutta-percha it is decidedly useful.

A modification of this alloy, made by increasing the quantity of silver to forty per cent., has considerable increase of edge strength at slight expense in discoloration. It is more reliable as a filling.

Amalgam No. 18 is for temporary purposes only. It is easily used anywhere, will wear for several weeks, and is very easily removed with an excavator.

We have only two cements for filling teeth, the oxyphosphate of zinc and the oxychloride of zinc. In one the fluid is a syrupy solution of glacial phosphoric acid, and in the other a solution of chloride of zinc; the powder is the same in both. I have already published reliable formulæ for these preparations, but it may not be amiss to give them here.

The powder for both these cements is made as follows: Take of zinc oxide (U. S. P.) and pure nitric acid, each equal parts by weight. Spread the oxide upon a large glass slab (a window-glass will do), and sprinkle or drop the acid upon it little by little. Mix with a wooden spatula, transfer to a crucible, and subject to a strong heat until it is a bright yellow. Maintain at this point for about 30 minutes, or until nitrous acid fumes have ceased to pass off. Remove, and when cold reduce to a fine powder in a mortar.*

The fluid for the oxyphosphate cement is made thus: Take of glacial phosphoric acid one ounce, and rain-water two ounces. Dissolve by gentle heat and filter through paper. Place in a glass or porcelain capsule, and evaporate over a sand-bath until the fluid begins to thicken. Allow it to cool gradually. Crystals will form, and after two or three days pour off the liquid and it is ready for use. Should the fluid as thus prepared not work satisfactorily, add to it a little water—two or three drops at a time—until it works properly.

The fluid for the oxychloride is made thus: Take of chloride of zinc, one ounce; water, one drachm; dissolve and filter. This is for a quick-setting cement for filling cavities. For a slow-setting cement,

* It is necessary that this powder should be made *very* fine, otherwise failure is certain.

suitable for filling roots, use half an ounce of water to one ounce of the chloride.

The properties which the cements have in common are: Plasticity, ease of introduction into the cavity, perfect adaptation to the walls of the cavity, hardness, non-conductivity, and great possibilities in imitating the natural color of the teeth. They are the most perfect filling materials for tooth preservation known. Secondary decay, when the cement is used, is almost unknown. They are both somewhat antiseptic and will obtund sensitive dentine. They have one common fault,—they are more or less readily soluble in the fluids of all mouths, and are therefore very unreliable as to durability.

The oxyphosphate is considered the most reliable of the two cements. It is putty-like, somewhat sticky, and very tenacious. It is not a good temporary filling because somewhat difficult to remove; and it is nothing but a temporary material in most cases, although more is expected of it. In some mouths it is durable. It is very quick setting.

The oxychloride is an antiseptic filling. It is not sticky, nor putty-like, but is easily applied and pressed to place. It clings to cavity-walls and is a perfect tooth preserver. In durability it is not much inferior to the oxyphosphate. It gives considerable pain for a short time after insertion into vital teeth. Mixed to a creamy consistency, it is easily flowed into root-canals.

Gutta-percha is practically a simple material, inasmuch as the matter incorporated with it (usually oxide of zinc) is designed merely to give it the proper consistency and prevent stickiness, and is entirely inert in its action upon the tooth.

This material is a very excellent one, and is a great tooth preserver. It is plastic, easily inserted, non-conductive, and clings to the cavity-walls. It is durable also when protected from wear, but changes somewhat upon its surface; and an old gutta-percha filling is not an attractive object. It has very little durability upon a masticating surface. It is very useful for temporary fillings, and as a non-conductor in overlaying sensitive places.

Chloro-percha is a solution of the above in chloroform. It has only one use,—for filling root-canals. It shrinks very badly and is very sticky, but it produces a most excellent filling.

Having now discussed in general the demands made upon filling materials and the properties which these materials present, consideration will next be had of particular cases and the selection of materials therefor. For convenience, those materials which in the opinion of the writer are best adapted to the case in hand, will have first mention, bearing in mind that any of the general complications already mentioned may be cause for a rearrangement of the selections. For this purpose it is necessary to make a classification of cavities according

to their needs and complexities. Italics will indicate that the material so marked is always to be used unless strongly contra-indicated.

Class first will consist of the central incisors, the lateral incisors, and the cuspids of both jaws. While it is true that there are some obstacles to be encountered in working upon these teeth in the lower jaw that are not within the upper jaw; still the demands are the same in both locations and must be met as nearly as possible.

Labial Cavities.—Selection, *gold*, cement, amalgam No. 35, gutta-percha.

Here one of the important indications is appearance. In this gutta-percha is lacking, and so also is amalgam. These cavities are nearly always located at the gingival margin, and when very large and exceedingly difficult to keep dry, the indications would point to a substitute for gold. This exigency is more frequently met with upon the lower jaw and upon the cuspid teeth than elsewhere in this class. While strenuous efforts should be made to use gold, this substitution is quite frequently justified. As moisture also interferes with the proper use of gutta-percha, there remain but cement and amalgam No. 35 to choose from; in which instance I should prefer the latter.

Lingual Cavities.—Selection, *gold*, amalgam No. 40, gutta-percha, cement.

These cavities are rare and are almost confined to the cingulum, in the upper lateral incisors. There is no good reason for the non-use of gold in all cases.

Approximal Cavities.—Selection, *gold*, amalgam No. 35, cement, gutta-percha.

These cavities are almost always readily filled with gold. There is nothing to prevent its use except expense, and if cheap material *must* be used under protest, amalgam will give greater durability than cement, and better appearance than gutta-percha.

Incisive Surface Cavities.—Selection, gold.

Compound Cavities.—Selection, *gold*, cement.

Class second consists of the bicuspids and the first upper molar. My reason for omitting the lower molar from this class is that difficulties begin a little farther forward on the lower than upon the upper jaw, and also for the reason that the lower back teeth are more out of sight than the homologues of the upper jaw.

Buccal Cavities.—Selection, gold, amalgam No. 35, gutta-percha, cement. The same considerations hold here as in labial cavities upon front teeth, save that these cavities are perhaps more apt to be large when we first see them, and there is perhaps a little less strenuous necessity for the use of gold should obstacles arise. As a rule, however, there is nothing to prevent the use of that metal.

Lingual Cavities.—Selection, amalgam No. 50, gold, cement.

These cavities are rare, except as an encircling groove at the gingival margin, exceedingly difficult to fill properly with gold; hence I would use amalgam. But well-defined cavities in this locality I would treat in the same manner as if upon the buccal surface.

Approximal Cavities.—Selection, gold, amalgam No. 50, cement.

This has reference only to simple approximal cavities, and does not include compound cavities, nor those which it is deemed best to make compound.* It is probable that it is the rule with most practitioners to compound, by including a portion of the masticating surface, almost all approximal cavities occurring in bicuspids or molars except where adjoining teeth are missing.

Masticating Surface Cavities.—*Gold*, amalgam No. 70. There is ordinarily little reason for not using gold in these cavities.

Compound Approximal Cavities.—Selection, *gold*, amalgam No. 70, amalgam No. 50, cement.

As these cavities are often pretty large, No. 70 amalgam may set too rapidly for contouring, in which case No. 50 should be used, or the two can be combined with good effect, using No. 70 for the masticating surface. In mesial cavities gold is strongly indicated.

Class third consists of the second upper molar and the first and second lower molars.

Buccal Cavities.—Selection, amalgam No. 50, gold.

These cavities are of two classes, those which have their beginning in the buccal pit and those commencing at the gingival margin. The latter are the most extensive, and should be almost invariably filled with amalgam. The former may be filled with gold.

Lingual Cavities.—Selection, amalgam No. 50.

Compound Approximal Cavities.—Gold, amalgam 70, amalgam 50.

Upon the mesial surface it will be usually found advantageous to use gold; still it need not be used if circumstances do not *fully* warrant it. Upon the distal surface I think in a majority of cases it is better to use amalgam.

Masticating Surface Cavities.—Selection, *gold*, amalgam No. 70.

Class fourth, the dens sapientia. These teeth are ordinarily very difficult to fill, and except under very favorable circumstances I should fill all cavities with No. 50 amalgam. In case they are easily accessible, as, for instance, when the early loss of the first or second molars has permitted them to come forward, they can be placed in class third.

Root Canals.—Selection, oxychloride of zinc, chloro-percha.

I consider these the only two materials suitable for this purpose, and think both are aided by combining with gutta-percha points.

* It seems unnecessary to explain the term *compound* as here used, but that I may not be misunderstood I will say that the word indicates that more than one surface is involved.

(TO BE CONTINUED.)

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A. L. HUMMEL, M.D.

A LETTER RELATING TO PIL. ANTISEPTIC AND ANTISEPTIC COMP

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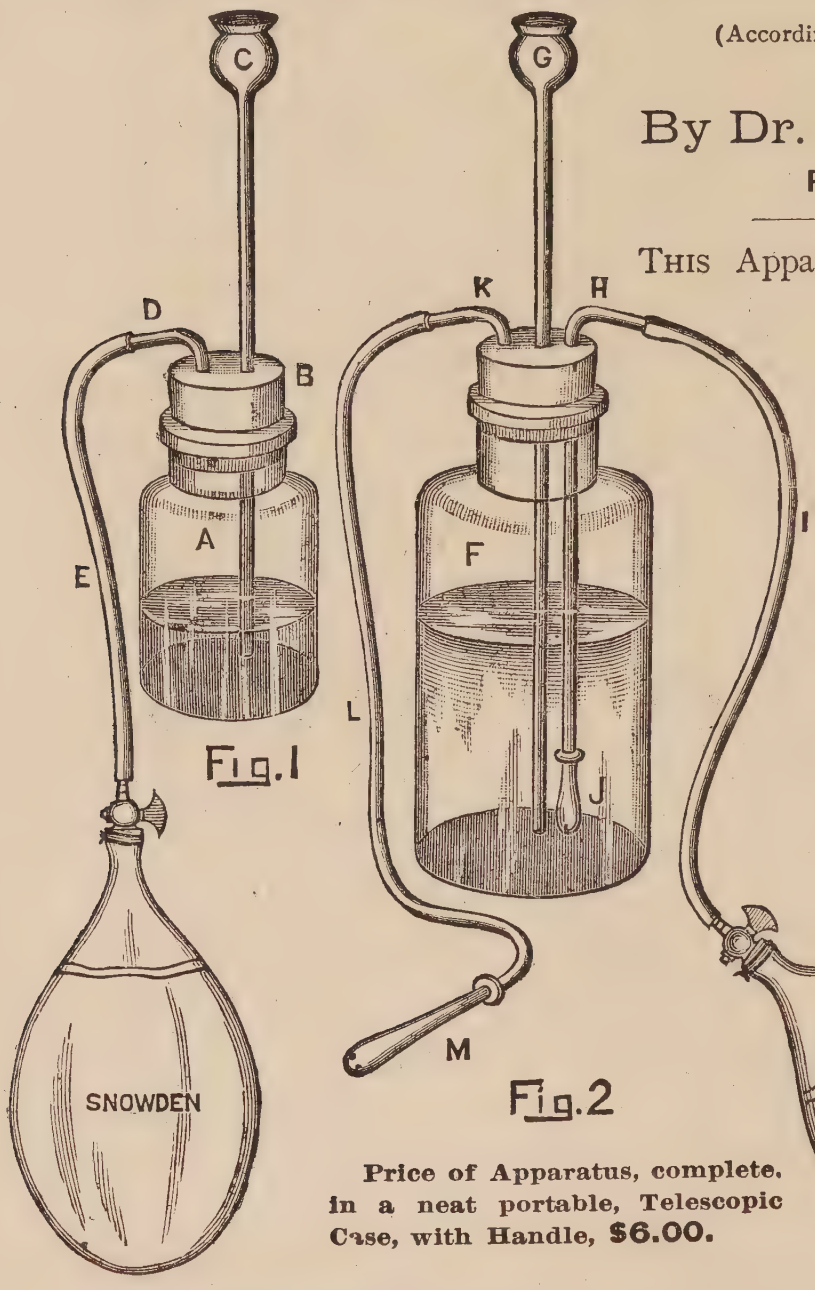

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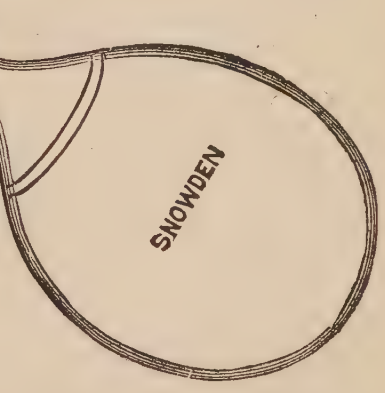
Fig. 2



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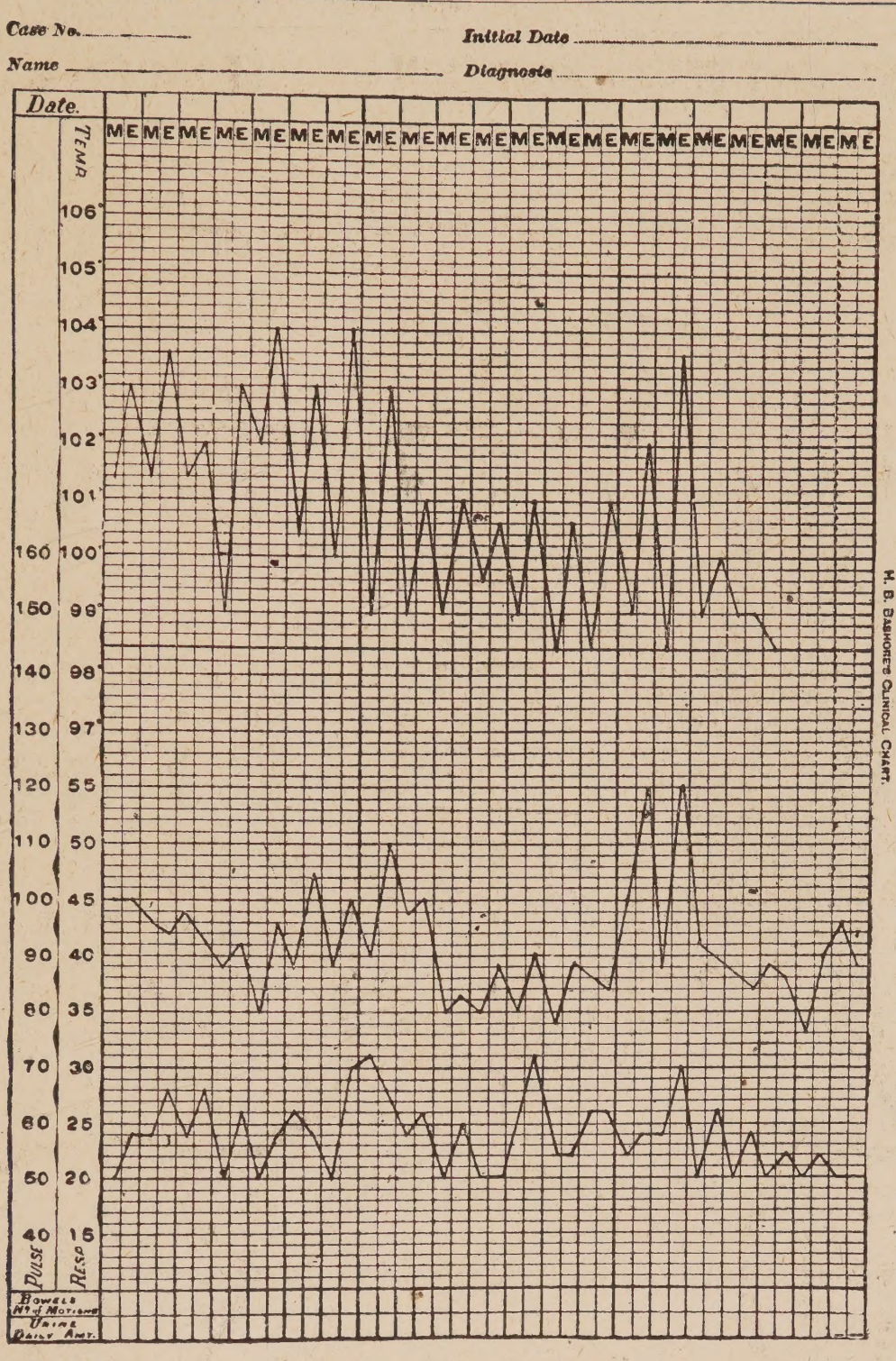

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